



# **MANUAL FOR THE APPRAISAL OF TIMBERLAND**

May 2004

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## CHAPTER I.

# Introduction

In 1978, voters approved a constitutional amendment, Article VIII, Section 1-d-1, permitting appraisal based on the productive capacity or “productivity value” of timberland. The new constitutional amendment took effect in 1979. In enacting the Tax Code that year, the 66th Legislature, 1979, adopted Tax Code, Sections 23.71-79, implementing Section 1-d-1 for land qualified for timber productivity appraisal.

The Tax Code assigns most qualified timber appraisal responsibilities to the chief appraiser. However, the Tax Code, Section 23.73 and Section 23.75, direct the comptroller to develop a manual for appraising qualified timber and an application form and distribute them to appraisal districts. Tax Code, Section 23.73, also directs the comptroller to develop procedures for verifying that land qualifies for timber use appraisal.

This manual sets out both the eligibility requirements for timberland to qualify for productivity appraisal and the methodology for appraising qualified timberland. Appraisal

districts are required by law to follow the procedures and methodology set out in this manual.

This manual has been adopted by reference in State Comptroller Property Tax Rule 9.4011 (See Texas Register, April 30, 2004.)

This manual can be found on the Comptroller’s Web site Window on State Government at [www.window.state.tx.us](http://www.window.state.tx.us) and clicking on publications under Property Tax Reports. The manual is under the heading “Special Manuals” and previous issues of the manual can be found under the “Archives-Historical Information” heading at the bottom. You may request a copy of this document published in booklet format from the Comptroller of Public Accounts, Property Tax Division, P.O. Box 13528, Austin, Texas 78711-3528 or calling the Property Tax Division at 1-800-252-9121 or direct in Austin at 512/305-9999.



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## CHAPTER II.

# Qualifying Timberland for Productivity Appraisal

### Background

In this manual, the word “timber” refers to standing trees that are grown to produce commercial wood products, such as sawtimber, pulpwood, poles, and chips. “Timberland” refers to forestland that is capable of producing commercial wood crops.

Timberland in Texas varies in many ways. A pine plantation may have trees just over a year old, while another pine plantation may have much older and taller trees. Hardwoods may be the only timber on one tract, while other tracts may have pine trees or a mixture of hardwoods and pine. In addition, soil productivity—a key determinant of timber growth—often varies dramatically from one timber tract to another, even within the same county.

The degree of intensity with which timber producers manage the land also differs. Some owners practice custodial care, which means the owner does nothing to manage the land, while other owners manage their land intensively. Timber plantations are usually managed intensively. However, some plantation land may require little management for a few years, then need sophisticated, intensive management for several years. For example, a timber plantation that is between thinning activities and prescribed burning may need little management, but final harvest and preparation for replanting require intensive management.

These variations among timber tracts and timber growing operations make determining eligibility for timber productivity appraisal a challenge for a chief appraiser. The chief appraiser must be familiar with timber activities in the immediate area and the forest region of which the appraisal district is a part.

A valuable source of information about timber activity and timberland use in the area is the “agricultural appraisal advisory board.” The Tax Code, Section 6.12, requires the chief appraiser to appoint, with the advice and consent of the appraisal district’s board of directors, an agricultural appraisal advisory board consisting of three or more members as determined by the board of directors. The law requires that

one of the members must be a representative of the county agricultural stabilization and conservation service. The other members must own land in the district that qualifies for productivity appraisal and must have been residents of the district for at least five years. The function of this board is to advise the chief appraiser on the valuation and use of land qualified for productivity appraisal, including agricultural land and timberland.

If chief appraisers plan to seek the advisory board’s advice on timber characteristics and timber management activities within their respective appraisal districts, they should appoint individuals who are knowledgeable about the area’s timber.

### **Eligibility Requirements for Timber Productivity Appraisal**

The Texas Constitution permits timber productivity appraisal only if the property and its owner meet specific requirements defining timber use. Land will not qualify simply because it has timber standing on it. In addition, timberland that is used principally for aesthetic or recreational purposes will not qualify.

The Tax Code, Section 23.72, sets the standards for determining whether land qualifies:

“Land qualifies for appraisal . . . if it is currently and actively devoted principally to production of timber or forest products to the degree of intensity generally accepted in the area with intent to produce income and has been devoted principally to production of timber or forest products or to agricultural use that would qualify the land for appraisal . . . for five of the preceding seven years.”

To qualify land for timber productivity appraisal, a property owner must show the chief appraiser that the land meets the Tax Code, Section 23.72, standard. To do so, the property owner must apply for the appraisal and give the chief appraiser the information necessary to determine if the land



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qualifies. The owner also must notify the chief appraiser of any changes in the land's status.

To qualify for timber productivity appraisal, landowners must meet each of the following six eligibility requirements.

- The land must be currently and actively devoted to timber production.
- The land must be used principally for timber production.
- The land must be devoted to timber production to the degree of intensity generally accepted for the area.
- The owner must have an intent to produce income.
- The land must have been dedicated principally to agriculture or timber production for any five of the preceding seven years.
- The property owner must file a timely and valid application form.

The first five requirements are discussed in detail in the "Eligibility Requirements" section. The sixth requirement, that the owner file a timely and valid application form, is discussed in the "Application for Timber Productivity Appraisal" section.

### ***Timber in Transition***

In 1997, the Legislature added Section 23.59 to the Tax Code and allowed for timber in transition. These are tracts that had been appraised as open-space land under Subchapter D, Chapter 23 of the Tax Code for at least five preceding years and are converting from an agricultural use to timber. The owner can elect for the land to continue to be appraised as open-space agricultural land for 15 years by submitting a new application for agricultural appraisal and indicating the conversion to timberland.

The land qualified as timber in transition will be appraised as if it were still in the same category of agricultural use that it was immediately before conversion to timber. The election will remain in effect until the end of the tax year in which the 15th anniversary of conversion occurs. During this period, the land must continue to qualify as timberland. The qualifications for timberland are discussed below. In the 16th and subsequent years and as long as the land continues to qualify as timberland, the land will be appraised as timber and its value will be determined based on the methodology set out in this Manual.

As an example, a tract of land in Polk County qualified as open-space agricultural land in 1995. The land's soil is Diboll-Keltys, which has a site index of 80. (See discussion of site index on Page 19.) The land was classified as Native Pasture I until March 2003 when the owner began

site preparation for conversion to a pine plantation. At that time, the owner submitted a new application for 1-d-1 Open Space Agricultural Appraisal and indicated the land was being converted from native pastureland to timber. As long as the land continues to qualify as timber, the tract will be appraised as if it were still Native Pasture I through the 2018 tax year. Beginning on January 1, 2019, the tract will be appraised as timber and classified as Pine II (See discussion of forest type and soil classification on Page 18).

### ***Timber Appraisal Applies to the Land***

Timber appraisal applies only to land and its potential for growing timber. It does not apply to improvements on land or to minerals.

- **Improvements.** Buildings and structures such as barns, sheds, or other outbuildings must be appraised separately at market value. Fences, however, are appurtenances and are not appraised separately. Land beneath outbuildings and other improvements related to timber use qualify for the special appraisal because the owner uses it in the timber producing operation.
- **Minerals.** Oil, gas, or any hard mineral must be appraised separately at market value.
- **Harvested and Standing timber.** Harvested timber in the owner's hands and located on January 1 of a tax year on the real property where it was produced and any standing timber is exempt from property tax.<sup>1</sup>

Some man-made alterations of, or additions to, timberland are appraised as part of the land. These appurtenances to the land—canals, water wells, roads, stock tanks, and other similar reshaping of the soil—are included in the value of the land and are not separately appraised.

## **Eligibility Requirements**

### ***Current and Active Devotion to Timber Use***

Under the Tax Code, Section 23.72, land must be "currently and actively devoted to timber use" to qualify for timber productivity appraisal. Unlike other types of property, the land may not have visible physical characteristics of qualification on January 1, but may still qualify. If timber use is not evident on January 1, the chief appraiser should investigate further to see if the owner can show that the land will be devoted to active timber production for the calendar year for which he or she is applying, by reason of other indications or evidence of current and active devotion.

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Determining if the owner is currently and actively devoting land to timber production is often a difficult and complicated task. Consider the following situations.

- The chief appraiser may not be able to see signs of activity when a timber operation is young, even though the owner may have spent a great deal of time, money, and effort to start the operation and is currently and actively devoting the land to timber use.
- A chief appraiser may not be able to see any management activity at the time of inspection if the owner has not harvested for some time.
- The chief appraiser may not be able to find evidence of active devotion if the size of the tract means that management activities take place away from the roads that give the chief appraiser access to the land.

However, the absence of visible physical timber activities on the land does not mean that the land is not currently and actively devoted to timber production. The chief appraiser should look for other indications of current and active devotion. The following are some indications of current, active devotion.

- **Timber activity records.** Is the owner able to produce records showing timber management activity? Some records that indicate timber management activity are documents showing timber has been harvested, canceled checks for services, contracts of sale, and land leases.
- **Forest Management Plan.** The owner operates under a current, written forest management plan. A forest management plan must be developed for the present time. An outdated plan is of no use as a management document. The plan also should be in writing and signed by the individual who prepared it.

However, the existence of a current management plan does not always mean the owner is following the plan. The owner should be able to show that he or she is using or intends to use the plan for timber production.

Knowledgeable timberland owners may prepare their own plans. If the owner of a marginal tract cannot afford a privately developed forest management plan, is on a waiting list to have a plan developed by a public agency, or lacks the expertise to develop his or her own plan, the chief apprais-

er should look for other evidence of current and active devotion.

- **Timber cost-sharing programs.** The owner receives Texas Reforestation Foundation (TRe), Environmental Quality Incentive Program (EQIP), Conservation Reserve Program (CRP) or Forest Land Enhancement Program (FLEP) cost sharing funds for reforestation and timber stand improvement. The Texas Forest Service coordinates the federal EQIP, CRP, and FLEP programs. TRe is a privately funded cost-sharing program administered jointly by the Texas Forest Service and the Texas Forest Association.
- **Efforts to sell timber.** The owner has letters or other documents showing efforts to sell the timber.
- **Salvage activity.** The owner has documentation showing that he or she has attempted to salvage damaged or dead timber that continues to have value.
- **Certified tree farm.** A certified tree farm is privately owned, protected, and managed timberland. Timberland must meet standards adopted by the American Forest Foundation for certification. Standards include management for sustainable forests and timely reforestation with desirable species. A certified tree farm is inspected by professional foresters before it may qualify for the program and is periodically re-inspected. Most certified tree farms are easily recognized by the green diamond-shaped "TREE FARM" marker placed in front of the property.
- **Memberships in associations.** The owner is a member of one of the following: the Texas Forestry Association; a county or local timber growers association; or a county or local timberland owners association.
- **Assistance programs.** Does the owner participate in a forest industry landowner assistance program? Many firms in the forest products and the pulp and paper industry have entered into agreements with private timberland owners to manage their timber in exchange for first chance to buy the timber when it is ready to harvest.

- **Participation in forestry extension activities.** The owner participates in forestry extension activities. The Texas Cooperative Extension offers periodic programs for timberland owners. They also offer on-line courses through their Cooperative Extension Curriculum Project.
- **Consulting foresters.** Has the owner contracted with or hired a private consulting forester to help manage his or her timber? What were the results of this collaboration? Is the owner operating on the written advice of a consulting forester?

### ***Timber Production Must be the Land's Primary Use***

Land that is currently and actively devoted to timber production will not qualify for productivity appraisal unless timber production is the land's primary use. If the owner uses the land for more than one purpose, the principal use must be growing timber. Although the distinction between "currently and active devotion" and "primary use" may be subtle, there is a difference between the two criteria.

While timber production must be the primary use of the land, other compatible uses do not prevent land from qualifying if timber production remains the primary use. For example, an owner may use land principally to grow timber and lease it for hunting. However, if hunting activities are the primary use of the land, and the timber is used to create an environment for wildlife production, then the land would not qualify for timber productivity appraisal.

The chief appraiser must determine all the uses to which the owner puts the land and decide which use is the primary one. If any use is incompatible with timber production, or if it replaces timber production as the primary use of land, the land is not principally devoted to timberland use and cannot qualify for timber productivity appraisal.

#### *Situations Where Timber Production may not be the Land's Primary Use.*

The primary use test is particularly important for timberland because the kind of intensive management required to grow agricultural crops is not necessary to grow timber. This less visible management activity can make determining the land's primary use a difficult job.

The following situations are intended to illustrate situations in which timber production may not be the land's primary use, although the land appears to be currently and actively devoted to timber production. In these or comparable situations, the chief appraiser should use the situation as a trigger for further, careful investigation of the application.

- **Presence of deer-proof fences on the property.** Although this is not always the

case, the existence of deer-proof fences around the property may indicate that the property is being used for wildlife management. The chief appraiser must then determine if the owner's principal use is timber production, hunting or wildlife management.

- **Presence of stock or wildlife ponds on the property.** Ponds are not normally necessary for the conduct of timber management activities or timber harvesting. The existence of ponds may trigger further investigation of the land's primary use.
- **Land being readied or held for development.** Some timber harvests may indicate that the land is being prepared for housing development rather than used principally to grow timber. (These are commonly referred to as "real estate cuts.") While a sign offering land for development or one indicating it is zoned for industrial or residential use might be an indication that land is being used principally for development, it is not conclusive and the chief appraiser should seek additional evidence.
- **Presence of homes, vacation facilities, retreats, and recreational facilities on the property.** The existence of dwellings and recreational facilities, such as retreats, camps, lodges, and similar facilities, may indicate that the timberland is being used to provide an aesthetic environment for these facilities. If this is indeed the case, timber production may not be the land's primary.

#### *Primary Use Guidelines*

A chief appraiser may establish a policy to follow reasonable and carefully developed guidelines for determining primary use. Establishing guidelines requires the chief appraiser to become familiar with timber activity in the area. The chief appraiser may also rely on the expertise of the agricultural appraisal advisory board in establishing primary use guidelines.

Guidelines, however, should serve only as a trigger for more investigation—they should not be arbitrarily or automatically applied. For example, a chief appraiser whose guidelines require a management plan should not automatically deny timber appraisal to an owner who does not have a plan. A property owner with no forest management plan may actually be managing the land more actively and intensely than other owners who have management plans. This land should qualify for productivity appraisal if its use meets all other eligibility qualification requirements. Instead, the chief ap-

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praiser should use the lack of a plan as a trigger to investigate the application more closely.

Guidelines that are applied arbitrarily or by rote can produce incorrect results. An application for timber productivity appraisal should not be denied outright because the chief appraiser discovers deer-proof fences, wildlife ponds, dwellings or recreational facilities on the property. The presence of these structures is an indication, not proof, that timber production may not be the land's primary use. In these situations, the chief appraiser should carefully investigate the land's primary use.

### ***Degree of Intensity***

To qualify for productivity appraisal, timberland must be used to the degree of intensity generally accepted for prudent timber growers in the area. The degree of intensity test is intended to exclude from productivity appraisal land on which token timber activity occurs simply to get tax relief.

The law doesn't set degree of intensity standards. The chief appraiser must develop standards after carefully investigating the area's typical timber operations performed by prudent landowners. After thoroughly studying the area, the chief appraiser should set minimum degree of intensity standards. The chief appraiser may also rely on the expertise of the agricultural appraisal advisory board in determining the typical degree of intensity for the prudent timber grower.

To set degree of intensity standards, the chief appraiser should analyze the major types of timber operations in the area. This analysis should break down the typical steps in producing timber and attempt to specify how much time, labor, equipment, etc., is typical for each type of timber operation. The sources listed in Appendix A may help the chief appraiser determine how much of these items are typically used.

Degree of intensity standards will vary from one timber growing area and operation to another. In general, there are three different levels of management intensity: custodial, minimal, and intensive.

Custodial management is "hands-off" management. The only activities the owner conducts are payment of property taxes and occasional visits to the site. However, it is highly unlikely that a timber property that shows no indication of management activity for two or more decades is being actively devoted to timber production.

Minimal management may fall anywhere between custodial management and intensive management. The owner may undertake some activities, such as periodic thinning, regular site visits, or maintenance of an access road.

Intensive management can involve many activities, including careful soil preparation for replanting, regular thinning

and/or prescribed burning to reduce competing vegetation, removal of undesirable trees, following a program to check for and control insects and disease, prompt actions to control insects and disease, and building and maintaining roads to the site.

Large timber plantations owned by corporations may receive intensive management; small operations owned by individuals may receive custodial management. The chief appraiser's degree of intensity standards should recognize these different levels of management activity and differences among timber operations.

In most cases, property owners must prove that they are following the common production steps for their type of operation and using typical amounts of labor, management, and investment. However, a timber growing operation is not disqualified simply because it differs from the typical operation in some respects. Appraisers should not, for example, disqualify a custodial timber operation because many comparably sized operations are more management intensive. Nor should an owner who is clearly meeting the degree of intensity test be disqualified because the operation has some element of the degree of intensity test missing. The total effort finally determines whether a given timber growing operation qualifies, not the level of each separate "input."

The degree of intensity test applies to the year of the appraisal only—it does not apply to the historical use (time period) requirement. Land used principally for timber for five of the preceding seven years may qualify although it was not used to the typical degree of intensity during those years. The chief appraiser should not apply minimum degree of intensity standards arbitrarily—they are a trigger for a more careful review of the application. For example, if the minimum standards require regular thinning of competing vegetation, the application should not be denied simply because the land is not thinned regularly. The chief appraiser should instead carefully review the application and inspect the property to determine if the land qualifies.

### ***Intent to Produce Income***

The owner must use the land with an intent to produce income. Like the degree of intensity test, this test excludes those owners who aren't producing timber and who are trying to use productivity appraisal to avoid paying property taxes on the land's market value.<sup>2</sup> Whether the owner has an intent to produce income is a fact question for the chief appraiser to decide.

To qualify, the owner is not required to prove that the land has produced income in the current year. Timberland does not produce income regularly because the time between harvests is long. At the time of qualification, however, the owner must show evidence of an intent to produce income.

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Land that does not produce income (in this context, income means net income) during the time in which a prudent manager would have produced income may not qualify. Further, an owner probably has no real intent to produce income if he or she has had no expenses directly related to the timber operation within the last two decades.

The chief appraiser may use expense receipts, canceled checks, or current accounts of expenses, labor, and revenues to determine if the owner has expenses directly related to timber production. An owner seeking to produce income usually will keep these types of records.

Some examples of evidence of intent to produce income are:

- Receipt of revenues through sale of timber;
- Letters or other documents showing that the owner has attempted to sell the timber;
- A contract of sale;
- Receipts, canceled checks, and other evidence that the owner has had expenses or income related to the timberland's use;
- Investments in improvements to enhance the value of the existing timber;
- Purchase of easements to allow loggers access to land-locked tracts;
- Investments in substantial amounts of reforestation or smaller amounts if other parts of the tract are already in commercial timber;
- Attempts to salvage timber that has value but that is damaged or dead;
- Using a consulting forester to help manage the land;
- Hiring someone to conduct a timber sale; and
- Seeking recommendations of a public forester before making a timber sale.

### ***Historical Use Requirement***

Land used primarily for either timber or agricultural production during any five of the previous seven years may qualify for timber productivity appraisal. A landowner may point to a history of agricultural use that would qualify the land for productivity appraisal in meeting this requirement. As long as either timber or agriculture was the principal use in the preceding years, the land qualifies although that use may not have met the degree of intensity requirement in all or some of those years. This historical use requirement attaches to the land. It is not a requirement for the landowner to show a history of timber production activities.

### **Application for Timber Productivity Appraisal**

The Tax Code, Section 23.75(b), requires the comptroller to prescribe the application form for timber productivity ap-

praisal. The comptroller's application form has been adopted by State Comptroller Property Tax Rule 9.402 (relating to Special Use Application Forms) and is available from the comptroller's Property Tax Division and through the agency Web site.

The appraisal district may copy the comptroller's form and offer it to local property owners. An appraisal district may use a form that substantially complies with the comptroller's form.

If the initial application is valid but does not contain all the information the district needs to rule on an application, the chief appraiser may require the applicant to give additional information. This procedure is described later in this section.

Where the district offers its own form, the applicant may choose between the comptroller application form and the district's form. An applicant may not be denied the appraisal because he or she chooses to use the comptroller form. The applicant must completely provide all information requested by the comptroller form.

Property owners must file applications with the chief appraiser in the appraisal district where the land is located. Taxpayers whose land is appraised by more than one appraisal district must file an application in each district.

The law requires chief appraisers to share appraisal information on properties within overlapping areas. Chief appraisers are also required to coordinate appraisal records and appraisal activities relating to properties in overlapping areas by written agreement. Appraisal districts must send a comptroller prescribed advisory notice to affected property owners informing them that required reports and other documents must be filed with or sent to each appraisal district. This advisory notice must also inform affected property owners that they should consider sending any other document relating to the property to each appraisal district.

A property owner may file a single application form covering all tracts within an appraisal district. Owners need not file a separate form for each tract as long as they provide sufficient information to show that all tracts qualify under the law.

The chief appraiser should encourage owners to file a single form if they are managing several tracts as a unit. The chief appraiser must view the entire timber growing operation as a unit—not with respect to the activities on each individual parcel. The single application form notifies the appraisal district of the operation's unity.

### ***Filing Deadline***

An application must be postmarked or filed no later than midnight, April 30. For good cause and only on the property owner's request, the chief appraiser may extend the filing deadline

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in individual cases for not more than 60 days. The property owner must request an extension before the filing deadline.

The Tax Code does not define “good cause.” However, it is commonly something the applicant cannot control. Illness or injury or an inability to transact normal business for a period that effectively prevents filing on time is usually good cause. Each appraisal district should prescribe its good cause requirements.

### **Late Application**

A property owner who misses the deadline may file a late application until the appraisal review board approves records for that year (usually about July 20). However, there is a penalty for late application. An application filed after April 30 is subject to a penalty equal to 10% of the difference between the tax if imposed at market value and the tax imposed at the timber productivity value. If the chief appraiser extended the deadline for that property owner, this penalty does not apply.

Chief appraisers must note imposition of the penalty in the appraisal records. They also must send the property owner written notice of the penalty and explain the reasons. The tax assessor adds the penalty amount to the tax bill and collects the penalty along with the annual tax payment.

A lien attaches to the property until the penalty is paid. If the penalty remains unpaid on February 1 of the following year (or a later delinquency date if tax bills are mailed late), penalty and interest on the penalty amount accrue as if it were a delinquent tax.

### **Failure to File the Application Form**

If a person does not file a valid application before the appraisal review board approves the appraisal roll, the land is ineligible for productivity appraisal in that tax year.

### **One Time Application**

Once the application is filed and approved, the land continues to receive productivity appraisal every year without a new application unless the ownership changes, the land’s eligibility changes, or the chief appraiser requires a new application. The chief appraiser may require a new application if he or she has good cause to believe that the land’s eligibility for productivity has ended. If the chief appraiser requires a new application, the property owner must meet the deadlines that apply to a new applicant. To better inform the taxpayer, the chief appraiser may wish to state in writing the reason for a new application.

### **Notification of Changes in Eligibility by Landowner**

If the land’s eligibility ends or its ownership changes, the property owner must notify the appraisal office in writing before the next May 1. New owners are not eligible for tim-

berland productivity appraisal unless they apply. If the owner fails to do so, one or more penalties will apply.

If the land remains under the same ownership and the owner fails to inform the appraisal district that the land is no longer eligible for productivity appraisal, either because the land is no longer in timber use or because the degree of intensity has fallen below that typical for the area, the property owner must pay a penalty equal to 10% of the difference between the taxes imposed under the timber use and the taxes that would have been imposed under the new use. This penalty applies for each year the property received the incorrect appraisal, but for no more than five years.

If the property erroneously receives productivity appraisal because a new owner failed to file an application or other reason, the chief appraiser must calculate the difference between the land’s market value and its productivity value. The owner must pay taxes and penalties on the difference between these values for the time that the land erroneously received productivity appraisal, plus a 10% penalty on these taxes. This additional tax and penalty may not cover a time period exceeding five years. In the year the chief appraiser discovers the change, the chief appraiser should add this value to the appraisal roll as property omitted in a prior year.

For example, if a timber producer reduces the scale of the operation and timber is no longer the land’s principal use, the land will not be eligible for productivity appraisal. If the landowner fails to notify the appraisal district and, therefore, receives productivity appraisal, the land is back assessed. For each year in question (not to exceed five years), the owner must pay the difference between the taxes based on productivity appraisal and the taxes based on market value, plus a 10% penalty on that difference. Because the land has not been taken completely out of timber use, it is not subject to rollback taxes. Rollback taxes are only imposed when land is no longer used for timber or agricultural purposes. Rollback procedures are discussed in detail in Chapter III.

When a penalty is imposed, the chief appraiser must notify the property owner. This notice must explain the procedures for protesting the penalty. The chief appraiser notes the imposition of the penalty in the appraisal records, and the tax assessor adds the amount of the penalty to the property’s annual tax bill.

### **Chief Appraiser’s Action**

The chief appraiser must review each application and decide whether to:

- approve it and grant productivity appraisal;
- disapprove it and ask for more information;  
or
- deny the application.

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The chief appraiser must determine the validity of all timely filed applications before turning all appraisal records over to the district's appraisal review board. The deadline is May 15 or as soon afterward as is practicable.

The chief appraiser usually gives the appraisal records to the appraisal review board (ARB) by May 15. Property owners who were denied productivity appraisal may file a protest with the ARB. In addition, taxing unit officials who believe productivity appraisal was erroneously granted to any property owner may seek to remove that grant by filing a challenge with the ARB.

The chief appraiser must rule on all late-filed applications before the appraisal review board approves the records for the year. The chief appraiser must notify the applicant in writing within five days of an application's denial. This notice must explain the procedures for protest.

#### *Additional Information*

The chief appraiser may request additional information. If the initial application form is valid but the chief appraiser does not have all the information needed to determine if the land qualifies, the chief appraiser may request additional information. The chief appraiser may request only additional information that is necessary to determine if the land qualifies for productivity appraisal.

In determining whether an application is valid, the chief appraiser should take care to consider the application as a whole. If the chief appraiser determines that the omission of a piece of information on the original application was a mistake, the chief appraiser may, at his or her discretion, either: (1) extend the filing deadline for 60 days; or (2) send a form requesting additional information.

Information contained in income statements and income tax returns, land lease rates, and lease agreements is not necessary to determine whether the land qualifies—other less invasive evidence of qualification exists. If the chief appraiser asks an owner for this type of information, the request should clearly state that the owner is not required to give the information to qualify for productivity appraisal. Laws related to confidential information must be observed.

The applicant must provide additional information within 30 days after the date of the request or the application will be denied.

If there is good cause, the chief appraiser may extend the deadline to allow additional information. An extension cannot exceed 15 days.

#### *Denial of Application*

If a chief appraiser denies an application, a notice of the denial must be delivered to the applicant within five days. This

notice must be sent by certified mail (See Section 1.07(d), Tax Code). The notice must explain the procedures for protesting to the appraisal review board. To better inform the taxpayer, the chief appraiser may wish to explain the reasons for denying the application.

### **Ineligibility for Timber Productivity Appraisal**

Even if land meets all the preceding conditions, some situations may block approval of an application.

#### ***Land Located Within the Boundaries of a City or Town***

Land within the boundaries of a city often will not qualify. Land located within an incorporated city or town must meet all the criteria for productivity appraisal and, in addition, must meet one of the following:

- the city must not provide the land with general services comparable to those provided in other parts of the municipality having similar features and population; or
- the land must have been devoted principally to production of timber or forest products continuously for the preceding five years.

#### ***Land Owned by a Non-Resident Alien or Foreign Government***

Tax Code, Section 23.77(2) and (3), provide that some kinds of foreign ownership make the land ineligible for productivity appraisal. Under the law, if the property owner is a non-resident alien (a non-United States citizen who does not reside in the United States), the land can't qualify. Similarly, the law states that a corporation can't qualify its land if a non-resident alien, a foreign government, or both control the corporation.

The Texas Supreme Court has held, however, that Tax Code, Section 23.56(3), barring foreign corporate and governmental ownership from qualifying land for agricultural appraisal, unconstitutionally violates the Texas Constitution's guarantee of equal protection.<sup>3</sup> Although the Court's opinion did not address the ineligibility of non-resident aliens (Tax Code, 23.56(2)), its reasons for holding subsection (3) of that statute unconstitutional also applies to the non-resident's eligibility for timber productivity appraisal.

The *HL Farms* case did not address timber appraisal, but the law making productivity appraisal unavailable to foreign owners is identical to the agricultural appraisal law. Tax Code, Section 23.77(2) and (3), is identical to Tax Code, Section 23.56(2) and (3). Because of the similarity between the agricultural appraisal and the timber appraisal sections, a court is likely to hold that *HL Farms* applies to timberland. Therefore, a chief appraiser should seek the advice of an attorney if the appraiser is confronted with an application for timber appraisal submitted by a foreign owner.

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### **1978 Value**

When the Texas Legislature adopted timber productivity appraisal, the law was written to create a minimum taxable value on timberland. Tax Code, Section 23.78, provides that the minimum taxable value of qualified timberland is the market value assigned to the land by the taxing unit in 1978. The purpose of this statute was to ensure that a taxing unit with a large amount of timberland would not suffer a serious decrease in its tax base after implementation of productivity appraisal. This means that timberland qualified for productivity appraisal will not be taxed on its productivity value if that value is less than the 1978 value.

The Tax Code requires a unit's tax assessor to compare the total productivity value for the parcel with the unit's 1978 value for the parcel. If the total productivity value is less than the total 1978 value, the unit's assessor must substitute the 1978 value for the entire parcel.

If the nature of the parcel has changed, the assessor must use historical value to reconstruct what the entire parcel's value would have been in 1978. For example, if a parcel includes more land in the current year than it did in 1978, the assessor may not substitute a 1978 per acre average for the new acreage. Instead, a unit's assessor must use historical data to determine what the 1978 value for the entire tract would have been for the unit.

A unit that did not exist in 1978, or that did not levy an ad valorem tax in 1978, may not substitute a 1978 value for the land's productivity value. The law permits only substitution of the 1978 value "for the unit." A unit that did not exist or that had no property tax in 1978 has no market value to substitute for the productivity value.

The tax assessor must determine or reconstruct a 1978 value for each unit for which the assessor collects taxes. Each unit's 1978 value must be applied separately from that of other units. The law does not provide for an average 1978 value that is applied for all units that had a 1978 value. Nor does it provide for a historical reconstruction that combines the taxing units having a value in 1978.

(For a discussion of Section 23.78 and its application, see: *Temple-Eastex, Inc. v. Spurger Independent School District*, 720 S.W. 2d 607, Tex. App. – Beaumont 1986, no writ.)

### **Wildlife Management Use**

In 1995, the Legislature amended the Tax Code to include wildlife management as an agricultural use that could qualify land for open space agricultural appraisal. This change does not apply to timberlands. Timberland owners interested in converting from timberland to wildlife management must first qualify for 1-d-1 open space appraisal. While timber production is included as an activity that can satisfy the historical use requirement needed to qualify for open space appraisal, the land must be devoted principally to an agricultural use in order to qualify for open space appraisal. Once land receives 1-d-1 open space appraisal, the use can be changed to wildlife management the following year.<sup>4</sup>

### **Land on Which 1-d-1 Appraisal is Waived**

An owner may waive his right to productivity appraisal. By barring the land from receiving productivity appraisal, the waiver insures that a taxing unit may depend on a certain level of tax revenue. This certainty may be critical to the survival of small taxing units or those that are in debt.

A waiver is effective for 25 years. Land may not qualify for productivity appraisal for the duration of the waiver. A change in ownership does not revoke the waiver. An owner may file a waiver on land that does not qualify for productivity appraisal. A waiver may be filed with some or all the units that tax the property.

A waiver filed before May 1 becomes effective when it is filed. For good cause, the chief appraiser may extend the May 1 deadline for 60 days. These waivers become effective the year following the filing year.

To revoke a waiver, the owner must file an application for revocation with the governing body of each taxing unit where the waiver is effective. The unit's governing body must vote to approve the revocation and make a finding the unit's debt obligations will not be affected.





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## CHAPTER III.

# Rollback Procedures for Timberland

### Introduction

State law imposes an additional tax on qualified timberland each time it is taken out of timber use and is no longer eligible for productivity appraisal. For the purposes of this manual, this additional tax plus accrued interest is referred to as a “rollback.”

The rollback recaptures the taxes the owner would have paid if the property had been taxed at market value each year of the preceding five-year period plus accrued interest. The rollback has two parts: (1) back taxes; and (2) accrued interest on those back taxes. The tax portion of the rollback equals the difference between the total taxes the owner actually paid in the five years preceding the change in use and the total taxes the owner would have paid on the property’s market value. The interest portion of the rollback is calculated from the dates on which the differences would have been due. A rollback is applicable only if the land was receiving productivity appraisal before its change of use.

A property owner may take land out of timber use either by ending timber operations or by diverting the property to a non-timber use. This “change of use” is the only event that triggers a rollback on timberland. If the property owner diverts only part of a timber property to a non-timber use, the rollback applies only to the changed portion.

Technically, the tax is an additional tax imposed by law on the date the cessation of timber production or change of use occurs. The rollback tax bill has its own delinquency date different from the delinquency dates of other tax bills.

### What is a Change of Use?

A change of use is a physical change. The owner must stop using the land to produce timber. For example, a timber grower who has been receiving timber use appraisal may decide to stop timber operations entirely. The grower has the timber cut, does not plant new trees and shows no intention of replanting. Because the owner has stopped all timber activity, productivity appraisal will be lost and the land will incur a rollback tax.

Reduced intensity of use at the owner’s option will cause a loss of productivity appraisal. For example, if the owner decided to use the land primarily for recreational purposes and timber is no longer the land’s principal use, the land would no longer be eligible for productivity appraisal. However, as long as the land is used for some kind of timber production, a rollback will not be triggered.

Reduced intensity resulting from acts of nature and financial hardships also will not prompt a loss of timber productivity appraisal. For example, severe fires, droughts or freezes may extend the normal time land can remain out of timber production. In such cases, the land remains eligible for productivity appraisal until the owner clearly shows an intent to give up timber operations permanently.

This principle also applies when damage is done to part of a tract. If a fire destroys 500 acres of a 3,000-acre forest—forcing the owner to temporarily cease timber operations on the 500 acres—the owner should continue to receive productivity appraisal on the destroyed part of the tract. In years of severe drought, many timber-growing operations fail. Because the owner invested money in the failed operation, planting may be delayed because money to start a new operation may not be available. Here as well, the land should continue to qualify until the owner clearly shows that timber production will no longer take place on the land.

### Timberland Development

Filing documents to plat land does not trigger imposition of a rollback. Only evidence that the actual use of the land has changed triggers the rollback. Plat documents provide some evidence of an intent to change use, but a physical change must occur, such as ceasing timber operations or installing utilities. Even in that case, the change of use may affect only part of the platted land. If the owner ceases timber operations on part of the platted land, only that part of the land is subject to rollback taxes.

### Failure to Reapply for Productivity Appraisal

An owner who is required to reapply for productivity appraisal but who fails to do so may lose his or her eligibility,

but will not suffer a rollback. Rollback requires an affirmative change of use. Failure to reapply alone does not signal an affirmative use change.

### **Use Changes That Do Not Trigger Rollback**

Some changes to a different type of use do not trigger imposition of a rollback. Changing from timber use to an agricultural use that qualifies land for 1-d or 1-d-1 appraisal or to a use that qualifies as restricted-use timberland does not trigger a rollback. See Chapter V beginning on Page 27 for a discussion of restricted-use timberland. Property condemned, sold for right-of-way or transferred to the state or a political subdivision of the state for a public purpose use is not subject to a rollback even if its use changes. Filing a waiver of timber use appraisal with the appraisal district will not trigger a rollback if the use does not change.

### **Rollback is a Serious Economic Penalty**

Chief appraisers must use great care in determining when a change of use triggers a rollback. The imposition of a rollback is a serious economic penalty that should not be imposed when circumstances beyond a property owner's control cause an abnormally long but temporary suspension of timber production. Chief appraisers must keep in mind that change of use issues are often unclear and require a delicate balance between fair applications of the law and good decisions based on the facts of each situation.

### **Change of Use Determination**

The chief appraiser determines if and when the change of use occurs and must send the owner written notice of the determination. The notice must explain the owner's right to protest the determination.

The owner may contest the change of use decision by filing a protest with the appraisal review board within 30 days after the notice is mailed. The appraisal review board must hear a timely protest even if appraisal records have been approved for the year.

There are a number of ways for a chief appraiser to determine if a change of use has occurred. The chief appraiser may learn of a change of use from the owner's written notification, other filed transactions (such as a sale, issuance of a building permit), field observations, or word of mouth.

### **Rollback Calculation**

The rollback covers the five calendar years preceding the year in which the change in use occurred. For example, if the use changed in 2003, the rollback covers 2002, 2001, 2000, 1999, and 1998. The preceding years are based on the use from January through December and not on the tax collection periods.

The tax portion of the rollback is the difference between the taxes paid under productivity appraisal and the taxes that would have been paid on the market value of the land each year (Exhibit 1).

The assessor for each taxing unit must add 7 percent annual interest on these amounts from the date these taxes would have become due each year. The due date for each year is the date tax bills were mailed that year, which is normally October 1. Discounts for early payment do not apply to rollback taxes—discounts apply only to ordinary property taxes. The assessor must compute interest from the date the difference would have become due (normally October 1) to the date the change of use occurs.

Assuming that the use changed November 1, 2003, and that the assessor mailed tax bills on October 1 each year, the interest is calculated as shown in Exhibit 2 on Page 15.

The interest calculation for each year can also be performed using number of days only. For example, the 1998 interest would be calculated on the basis of 1,857 days (5 years – [365 x 5] + 32 days from October 1 to November 1). The interest can be computed by multiplying:

$$\$420 \times .07 \times (1,857 \div 365) = \$149.58$$

#### **EXHIBIT 1**

### **Example of Rollback Calculation**

<b>Year</b>	<b>Actual Tax Paid, Qualified Timberland</b>	<b>Tax That Would Have Been Paid on Market Value of Land</b>	<b>Difference Between Actual Taxes and "Market Value" Taxes</b>
2002	\$150	\$1,000	\$850
2001	\$125	\$900	\$775
2000	\$100	\$600	\$500
1999	\$90	\$550	\$460
1998	\$80	\$500	\$420

*Total Rollback Tax = \$3,005*

EXHIBIT 2

**Example of Rollback 5-Year Interest Calculation**

The 2002 interest runs from October 1, 2002 to November 2, 2003, or 1 year and 32 days.  
The formula for calculating the interest is:

\$ 850.00	=	Tax
\$ 59.50	=	$\$850 \times .07 =$ one year's interest (October 1, 2002 through September 30, 2003)
\$ <u>5.22</u>	=	$\$850 \times .07 \times (32 \div 365) =$ 32 days interest (October 1, 2003 through November 1, 2003)
\$ 914.72	=	Total 2002 tax and interest

The 2001 interest runs from October 1, 2001 to November 1, 2003, or 2 years and 32 days.  
The formula for calculating the interest is:

\$ 775.00	=	Tax
\$ 108.50	=	$\$775 \times .07 \times 2 =$ two year's interest (October 1, 1993 through September 30, 1995)
\$ <u>4.76</u>	=	$\$775 \times .07 \times (32 \div 365) =$ 32 days interest (October 1, 1995 through November 1, 1995)
\$ 888.26	=	Total 1993 tax and interest

The 2000 interest runs from October 1, 2000 to November 1, 2003, or 3 years and 32 days.  
The formula for calculating the interest is:

\$ 500.00	=	Tax
\$ 105.00	=	$\$500 \times .07 \times 3 =$ three year's interest (October 1, 1992 through September 30, 1995)
\$ <u>3.07</u>	=	$\$500 \times .07 \times (32 \div 365) =$ 32 days interest (October 1, 1995 through November 1, 1995)
\$ 608.07	=	Total 1992 tax and interest

The 1999 interest runs from October 1, 1999 to November 1, 2003, or 4 years and 32 days.  
The formula for calculating the interest is:

\$ 460.00	=	Tax
\$ 128.80	=	$\$460 \times .07 \times 4 =$ four year's interest (October 1, 1991 through September 30, 1995)
\$ <u>2.82</u>	=	$\$460 \times .07 \times (32 \div 365) =$ 32 days interest (October 1, 1995 through November 1, 1995)
\$ 591.62	=	Total 1991 tax and interest

The 1998 interest runs from October 1, 1998 to November 1, 2003, or 5 years and 32 days.  
The formula for calculating the interest is:

\$ 420.00	=	Tax
\$ 147.00	=	$\$420 \times .07 \times 5 =$ five year's interest (October 1, 1990 through September 30, 1995)
\$ <u>2.58</u>	=	$\$420 \times .07 \times (32 \div 365) =$ 32 days interest (October 1, 1995 through November 1, 1995)
\$ 569.58	=	Total 1990 tax and interest

**The rollback due amounts to \$3,572.25.**

*(This is the sum of amounts calculated above:  $\$914.72 + \$888.26 + \$608.07 + \$591.62 + \$569.58 = \$3,572.25$ .)*

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Interest for the other years – 1999, 2000, 2001, and 2002 – also could be computed by using days only. The resulting amounts would need to be added to the additional taxes due in each year to arrive at the total amount due.

### **Gaps in the Five-Year Rollback Period**

The five-year rollback period may cover one or more years when the property did not qualify for timber use appraisal. If the property used in the example above had been taxed on market value in 2001, the rollback tax would have been computed for 1998, 1999, 2000, and 2002.

### **When is the Rollback Due?**

The rollback is due when the rollback tax bill is mailed. It becomes delinquent if not paid before the February 1 that is at least 20 days after the tax bill is mailed. For example, if the rollback tax bill is mailed on January 9, 2003, it becomes delinquent on the February 1, 2003, because there are 20 days between February 1 and January 9. However, if the bill is mailed January 30, 2003, it becomes delinquent February 1, 2004. On the delinquency date, the entire amount begins to draw penalty and interest at the same rate as other delinquent taxes.

A tax lien attaches to the land on the date the use changes. The lien is imposed on behalf of all taxing units that levy

taxes on the timberland. The lien covers payment of the additional tax, interest, and any penalties.

## **Sale of Timberland and Rollback**

### ***Sale to Private Person***

The sale of timber property does not trigger a rollback tax. If land is sold and also changes use at the same time, the buyer and seller may dispute liability. Under the law, the person who has title to the property on the date the use changes is personally liable for the rollback, but the lien may be foreclosed against the land regardless of who is liable for taxes. Tax certificates on land that receives productivity appraisal must note the appraisal and state that the land may be subject to additional taxes.

### ***Sale to Exempt Organization or Government Entity***

Organizations that are exempt from ordinary property taxes are not exempt from the rollback. If qualified timberland is sold to an exempt organization and the organization continues timber use on the land, it continues to be exempt from property taxes. However, if the organization takes the property out of timber use, the rollback is triggered. In most cases, the tax lien can be enforced against the property.

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## CHAPTER IV.

# Timberland Appraisal Process

### Introduction

The productivity value of an acre of timberland equals the average annual net income a prudent manager could earn from growing timber over the five-year period preceding the appraisal's effective year, divided by a statutory capitalization rate. *Net income* has two parts: *gross income* and *production cost*.

Gross income is calculated by computing potential average annual timber growth per acre and multiplying this amount by timber's average annual market price for that year. This computation is performed for each year of the five-year period.

The average annual cost of producing timber in each of the five years is subtracted from gross income to find net income for the year.

Average annual net income is computed by averaging net income for each year of the five-year period. This five-year average annual net income is then divided by the statutory capitalization rate to produce the productivity value of timberland. Timberland's productivity value is determined in ten basic steps:

- *Step One:*  
Classify timberland into three forest types;
- *Step Two:*  
Classify timberland into four soil types;
- *Step Three:*  
Estimate average annual timber growth;
- *Step Four:*  
Convert timber growth into units for estimating gross income;
- *Step Five:*  
Estimate average annual timber prices;
- *Step Six:*  
Estimate average annual potential gross income of timber growth;
- *Step Seven:*  
Estimate average annual costs of producing timber;
- *Step Eight:*  
Estimate net income of timber growth;
- *Step Nine:*  
Capitalize net income by statutory rate to develop per acre timber values; and
- *Step Ten:*  
Apply timber values to timber acreage within the district.

This chapter of the manual prescribes the methodology chief appraisers must use to calculate timberland's productivity value. The law requires chief appraisers to estimate timber productivity values for three forest types and four soil types, and apply these values to the different classes of timber within their respective districts. (At most, an appraisal district may have 12 classes of timber—four soil types for each of three forest types. Some districts may not have 12 classes of timber. For example, a district that contained only pine forest might have four classes of timber: pine soil class 1, pine soil class 2, pine soil class 3 and pine soil class 4.)

Appendix B contains tables that illustrate this methodology, and the text frequently refers to these tables.

The Tax Code, Section 23.71, requires chief appraisers to use “the land's potential average annual growth” in computing timber's gross income. In this context, the word “**potential**” **does not mean actual**—it means “possible.” Consequently, the gross income of an acre of timberland is equal to the value of an average year's worth of possible growth. Chief appraisers must apply the value of a year's worth of possible growth to **all timber in each forest and soil type category, irrespective of the size of trees on any one tract**.

The result of defining gross income as the value of potential growth often confuses many timber growers, because trees of dramatically different ages and sizes may have the same values. Assume, for example, two tracts of timber, both planted in loblolly pine and both having the same soil type and other characteristics. One tract has pine seedlings six inches high from a recent replanting; the other has pine

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trees 80 feet high and ready for harvest. **If the chief appraiser is following the law's requirements on timber appraisal, both tracts should have the same appraised values per acre.**

The law uses the land's potential income because the tax is a property tax. If individual tracts were appraised on their individual incomes, the tax would be an unconstitutional income tax.

The Tax Code, Section 23.71, requires chief appraisers to use information from **four** different sources to determine forest types, soil types, average growth and timber prices. These are:

- United States Department of Agriculture (USDA) Forest Service;
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (formerly the Soil Conservation Service);
- Texas Forest Service; and
- Texas colleges and universities.

These sources are mandatory and are described in Appendix A. The one exception to this requirement is discussed below in last paragraph of Step One.

As noted earlier in Chapter II of this manual, the Tax Code, Section 6.12, requires chief appraisers to appoint an "agricultural appraisal advisory board." The function of this advisory board is to advise the chief appraiser on the use and valuation of timberland and agricultural land within the district. However, the board's advice on the appraisal of timberland does not take precedence over the law's requirements on data sources or the appraisal methodology set out in this chapter.

Before using data from any of these mandatory sources, chief appraisers should check with the relevant agency for updates. For example, the USDA Forest Service may periodically revise its published Texas timber survey numbers. The agency makes these revisions available to the Texas Forest Service. Chief appraisers should check with the Texas Forest Service for revisions to the Texas timber survey numbers before they use the survey data. In addition, chief appraisers should not use data from any of these sources in any manner different from that shown in this manual without first checking with the relevant agency to be sure they are using the data properly.

**The East Texas timber-growing region is composed of the 43 counties depicted in Appendix B, Figure 1.** Chief appraisers must use regional data and Texas Forest Service price data. Although the USDA Forest Service reports its

Texas survey data at the county level, this agency cautions that the county data are not reliable because of large sampling errors.<sup>5</sup> The Texas Forest Service reports forest product price data at the region level but not at the county level.

### **Step One: Classify Timberland into Three Forest Types**

The Tax Code, Section 23.71, requires chief appraisers to estimate timber productivity values for three forest types and four soil types. Chief appraisers should begin the appraisal process by classifying the timberland within their districts according to forest type. There are three basic forest types in Texas: pine, hardwood and mixed. These are as follows.

- **Pine.** Pine (and other softwood) timberland includes all forested areas in which the trees are predominately green throughout the year and do not lose their leaves. These trees are called evergreens. Forested areas where pine and other softwoods make up more than two-thirds of the trees free to grow are in this category.<sup>6</sup>
- **Hardwood.** Hardwood timberland includes all forested areas with a predominance of deciduous trees. These trees lose their leaves at the end of the frost-free season. Stands where hardwoods are more than two-thirds of the trees free to grow are in this category.
- **Mixed.** Mixed timberland includes all forested areas where both evergreen and deciduous trees are growing and neither predominates. An area is classified as mixed when evergreen and deciduous trees each make up more than one-third of the trees.

The Texas Agricultural Experiment Station at Texas A&M University in College Station has developed maps of forest types for Texas timber counties. These maps are available upon request for a nominal fee to cover reproduction costs.

In addition, chief appraisers may use aerial photographs, forest type maps and soil class maps from any governmental source that is recognized as competent to determine soil type, soil capability, general topography, weather, location and any other pertinent factors necessary to classify commercial timberland by forest type and soil type. If the chief appraiser elects to use maps from a data source not listed in Appendix A, the chief appraiser should exercise great care to be certain that the maps are the most current and reliable maps available and that the data source of the maps is a competent governmental source.

## Step Two: Classify Timberland into Four Soil Types

The law requires chief appraisers to classify all timber-producing areas in their districts into four soil types. The chief appraiser should use data from the USDA Natural Resources Conservation Service (NRCS) soil surveys to develop soil type maps for his or her district. The NRCS does not publish soil type maps that the chief appraiser may use in appraising timberland. However, the Texas Agricultural Experiment Station at Texas A&M University has used the soil surveys to develop soil type maps for timberland within most timber-producing counties in Texas. These maps are available upon request for a nominal fee to cover reproduction costs.<sup>7</sup>

Where soil maps based on appropriate NRCS data are not available, or if the chief appraiser chooses to develop his or her own soil-type map, the chief appraiser may use NRCS detailed soil surveys, if available, to develop soil-type maps. These detailed soil surveys show the site index (discussed later in this chapter) for each specific soil. A soil-type map can be derived using this information.

The NRCS's soil classification system is based on the concept of *site index*. Site index is a measure of the productive capacity of a forest site based on the average height of the tallest trees on the site at an arbitrarily chosen age. For example, if the average height of the five tallest loblolly pine trees in a fully stocked stand at the age of 50 years is 75 feet, the site index for loblolly pine trees on that forest site is 75. The NRCS publishes site index information in its soil surveys of Texas counties.

The NRCS soil surveys provide site index information for all land capable of growing commercial trees within each county. The NRCS site index data must be grouped into types that are generally comparable to the USDA Forest Service *site classes*, and this information should then be used to generate soil type maps. This is necessary because the USDA Forest Service reports timber growth data by *site class*, which is also a measure of soil productivity. However, the USDA Forest Service growth data by site class cannot be mapped since they were derived from a sample of selected sites in Texas.

The USDA Forest Service classifies all commercial timberland into five *site classes* based on the land's potential capacity to grow commercial wood crops. *Site class* is a measure of timber growth in cubic feet per year. The USDA Forest Service determines site class by measuring the height of the three tallest trees at a particular site, and then selecting the tree providing the highest estimate of site class.

The USDA Forest Service has defined these five site classes as follows:

- Land capable of producing *165 cubic feet* or more per acre per year;
- Land capable of producing at least *120* but less than *165 cubic feet* per acre per year;
- Land capable of producing at least *85* but less than *120 cubic feet* per acre per year;
- Land capable of producing at least *50* but less than *85 cubic feet* per acre per year; and
- Land capable of producing less than *50 cubic feet* per acre per year.

To comply with the law's requirement to use four soil types, chief appraisers must reduce these five site classes to four. The *over 165 cubic feet* site class should be combined with the *120-165 cubic feet* site class to produce the mandatory four soil types, because this produces a classification scheme that works well with NRCS site index data discussed below.<sup>8</sup> In this manual, this combined site class is called the *over 120 cubic feet site class*.

As noted earlier, the NRCS site index data must be grouped into ranges that are roughly comparable with USDA Forest Service's soil types. This grouping produces the following ranges shown in Exhibit 3 below.

### EXHIBIT 3

### Soil Classification Schemes

USDA Forest Service Site Classes	USDA NRCS Site Index Range
Over 120 cubic feet	Over 95 feet
80-120 cubic feet	80-95 feet
50-84 cubic feet	60-79 feet
Under 50 cubic feet	Under 60 feet

## Step Three: Estimate Average Annual Timber Growth

Chief appraisers must use growth data from private timberland that is the most current and reliable data available from one of the sources required by law. (See Appendix A for a discussion of these sources.) At the time this manual was written, the most current and reliable growth data available was the 1992 survey of Texas timber conducted by the USDA Forest Service. These data are used in various tables in Appendix B.<sup>9</sup>

Table 1 in Appendix B contains summary growth data for private timberland from the 1992 Texas survey. These data, which were prepared by the Texas Forest Service, show the average annual growth of Texas timber during the 1986-1992 period.<sup>10</sup> This growth is expressed in terms of five forest products for



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each of three forest types and four site classes for each Texas timber region.<sup>11</sup> Chief appraisers should use the data in Table 1 to calculate the average annual growth per acre for each forest type expressed in terms of forest products.

The forest products are large pine sawtimber, small pine sawtimber, pine pulpwood, hardwood sawtimber, and hardwood pulpwood, and the forest types are pine, mixed and hardwood. To avoid confusion, it is important to remember that pine forests—defined above to be at least two-thirds evergreen trees—may produce both pine and hardwood forest products. Likewise, hardwood forests—defined to be at least two-thirds deciduous trees—may produce both pine and hardwood products.

Table 2 shows these calculations for the East Texas region. All calculations are based on the data in Table 1. The first page of Table 2 shows the steps necessary to compute growth for an average acre of pine in east Texas. For large pine sawtimber, for example (the forest product shown in the upper left-hand box), the chief appraiser should multiply the number of plots in each site class by the per acre growth for that site class.<sup>12</sup> Multiplying 220 (number of plots) by 317.43 (average growth per acre in board feet) in site class “120+” produces 69,834.60, which is the estimated total growth for this site class. The result of each calculation for the four different site classes is added and this sum is divided by the total number of plots for all four site classes. The resulting number, 203.21 board feet, is the average annual amount of large pine sawtimber grown on the average acre of pine in east Texas.

The computation methods necessary to calculate the average annual growth of the other forest products—small pine sawtimber, pine pulpwood, hardwood sawtimber, and hardwood pulpwood—are identical to those for large pine sawtimber. Table 2 shows that the average acre of pine forest in east Texas grows annually 203.21 board feet of large pine sawtimber, 111.08 board feet of small pine sawtimber, 14.14 board feet of hardwood sawtimber, 30.65 cubic feet of pine pulpwood and 3.30 cubic feet of hardwood pulpwood.

The chief appraiser should use these same procedures to compute the average annual growth of an average acre of both mixed and hardwood forests in the rest of east Texas. Complete calculations for all forest types are shown in Table. The results of the detailed calculations illustrated in Table 2 are summarized in Table 3.

#### **Step Four: Convert Average Annual Timber Growth**

As shown in Tables 1-3, the USDA Forest Service measures sawtimber growth estimates in the International 1/4 inch log rule and measures pulpwood growth estimates in cubic feet. A “log rule” is a scale for measuring the amount of sawtimber that can be produced from a tree.<sup>13</sup> The Texas Forest Service collects timber sales data bi-monthly from timber buyers and sellers; however, buyers and sellers report sawtimber trans-

actions in tons. Consequently, the next step in the appraisal process is conversion of the growth estimates to the same scales in which forest product selling prices are reported.

The chief appraiser must use a log rule conversion table to develop factors to convert sawtimber growth from one log rule to another. Table 4 contains factors for converting board feet from the International 1/4 inch log rule to the Doyle log rule for east Texas. The individual conversion factors shown in the fifth column of these tables are for Texas timber. Chief appraisers should use these log rule conversion factors until subsequent log rule conversion factors are developed based on reliable and scientific data from sources listed in Appendix A and the factors are approved by the comptroller.

The first two columns in Table 4 are from the 1992 USDA Forest Service survey and show timber volumes by tree diameter class in east Texas. The fourth column, titled *percent of total volume*, shows volume for each diameter class as a percent of total volume. At the top of Table 4, for example, the reported volume for pine in diameter class 11-12.0 inches is 5195.1 million board feet. The 5195.1 million board feet is divided by *total volume*, 24,003.10 million board feet, to produce the percentage figure of 21.64%. The fifth column, titled *conversion factor*, is for Texas timber. The percentage and conversion factor for each diameter class are multiplied to produce the *weighted contribution* shown in the sixth column. Finally, these weighted contributions are added to produce the *weighted conversion factor* for pine in north-east Texas, which is 0.60258. The computations for the other conversion factors are identical. The timber volume data shown in both tables are for privately owned timberland.

After calculating the weighted conversion factors for large pine sawtimber and hardwood sawtimber as illustrated in Table 4, chief appraisers should apply these conversion factors to the sawtimber growth estimates summarized in Table 3. The results of these computations are shown in Table 5 Appendix B. For example (Table 5), the chief appraiser should multiply 203.21 board feet of large pine sawtimber in the International 1/4 inch log rule (Table 3) by the weighted conversion factor of 0.6258 to get 122.45 board feet of pine sawtimber in the Doyle log rule. To convert the 122.45 board feet to *thousand board feet*, the chief appraiser should divide 122.45 by 1,000 to get 0.12245. This measure of board feet must now be converted to tons to conform to the net-to-land definition in Section 23.71(2) of the Tax Code. The conversion factors for this calculation are provided by the Texas Forest Service and published in their *Texas Timber Price Trends*. The chief appraiser multiplies the growth in board feet measured by the Doyle Rule by the ton conversion factor. Following the example above for large pine sawtimber, the calculation is 0.12245 board feet times 8.0000 to get 0.9796 tons of growth for large pine sawtimber. The computations for hardwood sawtimber are identical.

The small pine sawtimber must also be converted from board feet measured by the International 1/4 inch log rule to tons. The chief appraiser should use the conversion factors provided by the Texas Forest Service in its bi-monthly publication, *Texas Timber Price Trends*. The growth rate in International 1/4 inch log rule from Table 3, 111.08 board feet, is multiplied by the cord conversion factor of 500 to determine the growth rate in cords. The indicated growth in cords, 0.22216, is multiplied by the ton conversion factor of 2.6250 to determine the growth rate in tons. These calculations are detailed in Table 5.

In addition, the pulpwood growth volumes shown in Table 3 must be converted from cubic feet into cords and then into tons. The Texas Forest Service reports the appropriate conversion factors in its bi-monthly publication, *Texas Timber Price Trends*. Current issues suggested conversion factors for cubic feet of pine pulpwood and hardwood pulpwood to cords are 81 and 80, respectively. The conversion factors for cords to tons are 2.5625 for pine pulpwood and 2.8 for hardwood pulpwood. The results of these calculations also are presented in Table 4.

Table 5 in Appendix B summarizes the annual average growth of an acre of timberland by forest type and forest product in East Texas. All growth is shown as tons. Based on the 1992 Forest Inventory and Analysis, the average annual growth of an acre of pine forest in east Texas is:

- 0.9796 tons of large pine sawtimber;
- 0.5832 tons of small pine sawtimber;
- 0.0789 tons of hardwood sawtimber;
- 0.9697 tons of pine pulpwood; and
- 0.1155 tons of hardwood pulpwood.

### Step Five: Estimate Average Timber Prices

To determine the average annual gross income from an acre of timber, the chief appraiser should multiply timber growth by its *average annual price*, or *stumpage price*.<sup>14</sup> Before doing this, however, the chief appraiser must calculate the average annual stumpage price of each of the five forest products for each year of the five-year period preceding the year of appraisal.

A readily available source of stumpage price data is the Texas Forest Service, located in College Station, Texas. The Texas Forest Service is also an official source of data for timber appraisal. This agency collects timber prices in its bi-monthly surveys of forest industries, consulting foresters, government agencies, and large landowners and publishes selected summaries of price data in its publication *Texas Timber Price Trends*.<sup>15</sup> This publication reports selected price data for large and small pine and hardwood *sawtimber* sales, pine and hardwood *pulpwood* sales and other *miscellaneous* sales. Unpublished annual summaries of price data are available upon request.

The Texas Forest Service reports both unweighted average annual prices and weighted average annual prices for various forest products for both northeast and southeast Texas. These price reports are available upon request from the Texas Forest Service. Chief appraisers should compute a simple average of these two reported prices and use this simple average in their timber appraisals.

Table 7 shows an example of how to calculate average annual stumpage prices for five forest products for each year of the 1998-2002 period. As shown on Table 7, the average price for large pine sawtimber in 1998 was \$45.67 per ton; in 1999, \$42.01 per ton; in 2000, \$39.29 per ton, etc.

### Step Six: Estimate Average Annual Potential Gross Income

This section explains how chief appraisers should calculate the average annual potential gross income of timber growth. The steps in this calculation are:

- Compute average annual gross income;
- Calculate soil productivity multipliers; and
- Use soil productivity multipliers to adjust average annual gross income to potential gross income.

First, the chief appraiser should multiply the growth of each of the five timber products (Table 6) by its respective price (from Table 7) for each year of the five-year period. Table 8, Appendix B, shows these calculations. As shown on Table 8, for example, the average annual gross income for an acre of pine forest in northeast Texas was \$73.99 in 1998 and \$55.22 in 2002. These numbers were computed by multiplying each forest product growth estimate by its respective price and then summing the products.<sup>16</sup>

Next, the chief appraiser must adjust these gross income estimates to reflect different soil productivities. To do this, the chief appraiser should develop *productivity multipliers* to adjust the average gross income. Productivity multipliers must be computed from statutory data sources that are current and reliable. (As noted earlier, Appendix A contains a listing of official data sources.) At the time this manual was written, USDA Forest Service data were the only current and reliable data available for developing soil productivity multipliers.

The USDA Forest Service data needed to compute productivity multipliers are:

- the most recent forest survey data for Texas; and
- data contained in the Boyce study, conducted by the USDA Forest Service.

The Boyce study, named after one of its authors, determined in 1975 the average annual maximum potential amount of timber that could be produced on an acre of loblolly pine east of the Mississippi River in each of four soil productivity classes.<sup>17</sup> The soil productivity classes used in the Boyce study correspond to the soil classification scheme developed above in Step Two of this Manual. The example in Exhibit 4 below shows the Boyce study growth estimates by soil class.

The concepts of site quality class and site index range were discussed earlier in Step Two. As used in Exhibit 4, “potential timber growth per acre per year” is the Boyce study estimates of the maximum potential growth of an acre of loblolly pine in each soil productivity class under ideal conditions.

Table 9, Appendix B shows how to compute the average annual potential growth of an average acre. The first page of Table 9 lists acres by site class for each county in east Texas. These data are from the 1992 USDA Forest Service survey of Texas. The second page of Table 9 shows the results of multiplying the acreage in each site class in each county by the growth potentials developed in the Boyce study.

For example, the 15,300 acres in site class 165+ in Anderson County (Table 9) are multiplied by 163 (the growth potential for that site type). The result, shown on the second page of the table, is 2,493,900 cubic feet. This calculation is carried out for all site classes in each county. The resulting products are added to produce 1,351,804,300 cubic feet, which is the estimated total potential growth of timberland in east Texas. This total estimated potential growth is divided by the total number of acres, 10,990,400, to generate an estimate of the average annual potential timber growth of an acre of timberland in east Texas of 123.00 cubic feet per acre per year. As noted earlier, “average annual potential growth” is not the same as “average annual actual growth.”

Table 10, Appendix B shows how to calculate soil productivity multipliers for the four productivity classes for East Texas. Chief appraisers should compute these productivity multipliers by dividing the growth potentials from the Boyce study by the growth potential for the region. To compute the productivity multiplier for productivity class II timberland,

for example, the chief appraiser should divide 123 by 123.0 to generate a productivity multiplier of 1.00.

Table 11, Appendix B shows chief appraisers how to apply productivity multipliers to the average annual gross income estimates, which were developed in Table 8. In 1998 for example, the annual gross income of pine, \$73.99, is multiplied by the productivity multiplier for each productivity class. This produces estimates of the average annual potential gross income of each productivity class in 1998.

It is important to remember that this “potential gross income” measure is not an estimate of the actual income an individual timber grower could receive from the sale of timber in a particular year. It is a measure of the value of a year’s worth of possible growth in each timber category (forest type and soil productivity class) in the region.

### Step Seven: Estimate Average Annual Costs of Producing Timber

Texas law defines timber production costs as *reasonable management costs and other reasonable expenses directly attributable to producing timber that a prudent manager of the land and timber, seeking to maximize return, would incur in the management of the land and timber.* The costs of producing timber are expenses related to establishing, owning, protecting, maintaining, and improving timber. These costs may vary by forest type, soil productivity, management intensity and other factors.

Timber production costs include professional services, site preparation, tree planting and seeding, timber improvement, protection against fire, insects and diseases, prescribed burning, maintenance of property boundaries, road construction and maintenance, measurements of standing timber, selling costs, property taxes, equipment use, mileage traveled to/from property for timber management, personnel supervision and administration. Since many foresters may include several activities under one general classification, chief appraisers should understand the components of a particular timber management activity to avoid duplicating or omitting costs.

#### EXHIBIT 4

### Boyce Study Growth Estimates by Soil Class

Soil Productivity Class	Site Quality Class (cubic feet)	Site Index Range (feet)	Potential Timber Growth per Acre per Year (cubic feet)
Class I	Over 120	Over 95	163
Class II	85-120	80-95	123
Class III	50-84	60-79	85
Class IV	Under 50	Under 60	60

The cost model in Appendix C lists timber management activities and a typical frequency for each activity. The chief appraiser should use this general cost model as a basis for developing a district-specific cost model that reflects typical activities for a prudent manager in the district. Chief appraisers may add or delete activities to this model so that it reflects management activities that are typical for their respective districts.

After determining typical management activities and the frequency of each activity in the district, the chief appraiser should estimate the average annual cost of each activity. Sources of cost data are the Texas Forest Service, landowners within the district, private contractors, consulting foresters, and departments of forestry in Texas colleges and universities. The chief appraiser must develop costs that reflect typical management activities and typical frequencies for a prudent manager in the district.

Chief appraisers may develop an average, per acre cost for the typical tract in the district or an average, per acre cost for each type forest type. In either case, chief appraisers must adjust these costs to reflect different management costs for each category of timber. This is done because timber on more productive land is often managed more intensively, resulting in higher costs per acre. Adjusting average annual costs per acre for soil productivity classes is analogous to adjusting average annual gross income per acre to soil productivity classes, as discussed in Step Six.

Chief appraisers who develop one average cost for the typical tract must adjust this cost to reflect both forest type and soil productivities. To accomplish this, chief appraisers may use the following cost proration factors developed based on the Texas Forest Service's *Texas Timberland Management Cost Study* shown in Exhibit 5 below.

EXHIBIT 5 Cost Proration Factors*				
Forest Type	I	II	III	IV
Hardwood	0.45	0.40	0.30	0.20
Pine	1.20	1.00	0.80	0.35
Mixed	0.75	0.60	0.50	0.30

\* Factors may change based on future data from the Texas Forest Service.

Table 12 in Appendix B shows hypothetical costs for a hypothetical county in east Texas. The numbers in this table were created to illustrate the timber appraisal process, and chief appraisers should *not* use these numbers in their appraisals.

Table 13 in Appendix B shows the results of applying these cost proration factors to the hypothetical costs shown in Table 12. The chief appraiser should note that these cost proration factors are applied to an average cost for a typical timber tract. The proration factors adjust costs for both forest type and soil productivity class.

If chief appraisers develop an average cost for each forest type, they must adjust each of these costs to reflect the impact of different soil productivity classes. To accomplish that, chief appraisers may apply the relationships within soil classes above to make the adjustments. For example, assume that the chief appraiser determines that the average annual management cost of hardwood is \$15.00 and that most of the hardwood in the district in soil class II. This \$15.00 figure becomes the management cost for hardwood soil class II. The management cost for hardwood soil class I would be  $\$15.00 \times 1.125$ , or \$16.88. The 1.125 factor is derived by taking the relationship from the factors for hardwood in the table above ( $0.45 \div 0.40 = 1.125$ ).

The management cost for hardwood soil class III would be  $\$15.00 \times 0.75$ , or \$11.25. The 0.75 is the quotient of 0.30 divided by 0.40. The proration factor for hardwood soil class IV would be  $0.20 \div 0.40 = 0.50$  and the management cost would be  $\$15.00 \times 0.50 = \$7.50$ .

### Step Eight: Estimate Net Income of Timber

To calculate the average annual net income per acre for each timber type and soil productivity class, the chief appraiser must subtract the average annual cost per acre from the average annual potential gross income per acre. This calculation must be performed for each forest type and soil productivity class. The results are the average annual net income per acre by forest type and soil productivity class. Table 14 in Appendix B shows these computations for hypothetical counties in East Texas.

### Step Nine: Capitalize Net Income to Develop Timber Values

To complete the timber appraisal process, chief appraisers must develop an average net income for each forest type and soil productivity class for the prior five years of average annual net incomes, capitalize this average net income and apply these productivity values to the timber acreage in their appraisal districts. Table 15 shows how to perform these calculations for hypothetical appraisal districts in East Texas.

The productivity value of an acre of timberland is determined by dividing the average net income per acre for each forest type and productivity class by the capitalization rate mandated by the Tax Code, Section 23.74. Prior to 2004, the capitalization rate was set at the interest rate specified by the Farm

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Credit Bank of Texas (Bank) or its successor on December 31 of the preceding year, plus 2-1/2 percentage points.

Beginning in 2004 and until the Bank's interest rate on December 31 is greater than or equal to 7-1/2 percent, the capitalization rate will be the greater of:

- the interest rate specified by the Bank on December 31 of the preceding year plus 2-1/2 percent, or
- the capitalization rate used for the preceding tax year.

For instance, the capitalization rate used in 2003 was 6.4 percent (3.9 percent interest rate plus 2.5 percent). Assume the Bank's interest rate on December 31, 2003 is 3.7 percent. Since 6.2 percent, the Bank's 3.7 percent interest rate plus 2-1/2 percent, is less than the capitalization rate used in 2003, 6.4 percent, the capitalization rate for 2004 would be 6.4 percent. However, if the interest rate on December 31, 2003 had been 4.1 percent, the capitalization rate for 2004 would be 6.6 percent, the greater of 2003's capitalization rate (6.4 percent) and the Bank's interest rate on December 31, 2003 plus 2-1/2 percent (4.1 percent plus 2-1/2 percent, or 6.6 percent).

In the year after the Bank's interest rate is equal to or greater than 7-1/2 percent, a different method of determining the capitalization rate will be used. The capitalization rate for years after the Bank's interest rate first equals or is greater than 7-1/2 percent will be an average of the December 31 interest rate plus 2-1/2 percent and the capitalization rate used for each of the preceding four years; however, the capitalization rates used in the average cannot be for year's prior to the first year the Bank's interest rate was equal to or greater than 7-1/2 percent. The following example in Exhibit 6 will clarify the calculations, but the rates used are examples only and should not be used to determine capitalization rates for any year.

Chief appraisers also may contact the Comptroller's Property Tax Division to find out the current year's capitalization rate.

Table 15 shows the results of dividing the net income per acre by a capitalization rate of 6.40 percent. For example, for pine forest, soil productivity class I, the chief appraiser would divide \$36.44, the net income per acre, by 0.0640, the capitalization rate, to get \$569.38, the productivity value of the average acre of pine forest in soil productivity class I. The chief appraiser should perform these calculations for each forest type and each soil productivity class in the appraisal district.

### **Step Ten: Apply Timber Values to Timber Acreage within the District**

The chief appraiser should apply the per acre values developed in Step Nine to the respective acreages of each parcel of qualified timberland in each forest type and soil productivity class in each taxing jurisdiction.

In determining the forest type and soil productivity class of qualified timberland in the district, the chief appraiser should use maps from one or more of the five official sources listed in Appendix A. As noted earlier in Step One, chief appraisers may use aerial photographs, forest type maps and soil class maps from any governmental source that is recognized as competent to determine soil type, soil capability, general topography, weather, location and any other pertinent factors necessary to classify commercial timberland by forest type and soil type. If the chief appraiser elects to use maps for classifying timberland within his or her district from a data source not listed in Appendix A, the chief appraiser should exercise great care to be certain that the maps are the most current and reliable maps available and that the source of the maps is a competent governmental source.

## EXHIBIT 6

**Capitalization Rate Calculation**

Year	Bank Interest Rate	Bank Interest Rate Plus 2-1/2 Percent	Capitalization	Comments
1	4.50%	7.00%	7.00%	
2	5.50%	8.00%	8.00%	
3	4.50%	7.00%	8.00%	Capitalization rate is the greater of Bank's interest rate plus 2-1/2 percent or previous year's capitalization rate.
4	3.50%	6.00%	8.00%	Again, the previous year's capitalization rate is greater than the current interest rate plus 2-1/2 percent.
5	7.50%	10.00%	10.00%	This is the first year the interest rate plus 2-1/2 percent is greater than or equal to 10 percent, so subsequent years' capitalization rates will be based on averages.
6	6.50%	9.00%	9.50%	The calculation to determine Year 6's capitalization rate is: $(10.00\% + 9.00\%) \div 2 = 9.50\%$ , or the average of the previous year's capitalization rate and the current year's interest rate plus 2-1/2 percent. The average would not include years prior to Year 5.
7	5.50%	8.00%	9.17%	The calculation to determine Year 7's capitalization rate is: $(10.00\% + 9.50\% + 8.00\%) \div 3 = 9.17\%$ , or the average of the previous two years' capitalization rates and the current year's interest rate plus 2-1/2 percent. The average would not include years prior to Year 5.
8	6.50%	9.00%	9.42%	The calculation to determine Year 8's capitalization rate is: $(10.00\% + 9.50\% + 9.17\% + 9.00\%) \div 4 = 9.42\%$ , or the average of the previous three years' capitalization rates and the current year's interest rate plus 2-1/2 percent. The average would not include years prior to Year 5.
9	7.50%	10.00%	9.62%	The calculation to determine Year 9's capitalization rate is: $(10.00\% + 9.50\% + 9.17\% + 9.42\% + 10.00\%) \div 5 = 9.62\%$ , or the average of the previous four years' capitalization rates and the current year's interest rate plus 2-1/2 percent.
10	8.00%	10.50%	9.64%	The calculation to determine Year 10's capitalization rate is: $(9.50\% + 9.17\% + 9.42\% + 9.62\% + 10.50\%) \div 5 = 9.64\%$ , or the average of the previous four years' capitalization rates and the current year's interest rate plus 2-1/2 percent.



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## CHAPTER V.

# Restricted-Use Timber Land

### Background

To encourage reforestation of harvested lands and effective management practices, the Texas Legislature amended the Tax Code by adding Subchapter H to Chapter 23 to provide for restricted-use timberland appraisal. The new subchapter was effective January 1, 2000. Owners of timberland who harvested and reforested by seedling plantings or managed natural regeneration on timberland where harvest was restricted in order to protect critical wildlife habitats, provide roadway buffers, preserve special or unique sites, and protect streams and other water bodies can apply for this special use appraisal.

### Eligibility Requirements

Land can qualify as restricted-use timberland as the result of either of two separate conditions:

- timber harvest is restricted in areas designated as an aesthetic management zone, critical wildlife habitat zone or streamside management zone or
- timber is harvested and regenerated by plantings or natural regeneration.

### *Aesthetic Management, Critical Wildlife Habitat, and Streamside Management Zones*

The Texas Forest Service (TFS) was directed to adopt an administrative rule governing the requirements for land to qualify as being in one of the three zones.<sup>18</sup> Useful definitions included in the rule are:

**Basal area** – the cross-sectional area of a tree, in square feet, measured at 4-1/2 feet above the ground.

**Public right-of-way** – A United States or state highway, a county road, a farm to market road, other public maintained roads, and public use areas such as public park, school, lake, cemetery, and church.

**Management plan** – A written plan or a collection of written directives governing management of an applicant's timberland that the landowner has developed, written, and implemented, with or without professional assistance. The plan must use the forestry best management practice consistent with the agricultural and silvicultural nonpoint source pollution management program administered by the State Soil and Water Conservation Board under Agriculture Code, §201.126, identifying specific management practices, including restrictions on harvest, for each of the types of zones included in the plan.

Aesthetic management zones are timberlands that the TFS has already determined are special or unique (based on natural beauty, topography or historic significance) or timberlands along public rights-of-way. The buffers must be at least 100 feet but not more than 200 feet wide along any side, contain trees at least ten years old or 35 feet tall, and contain a tree density equaling 50 feet of basal area per acre. The landowner must comply with a management plan that addresses harvest restrictions assuring the ongoing aesthetic value of the zone.

Critical wildlife habitat zones are timberlands on which harvest is restricted in order to protect the habitat of plant or animal species listed as endangered or threatened by the Federal Endangered Species Act or listed as endangered by the Texas Parks and Wildlife Code. The existence of the species and a plan to protect it must be documented by an agreement with a federal, state or private organization that is responsible for protecting the species. To qualify for the special appraisal, the landowner must provide three of the following seven benefits: habitat control, erosion control, predator control, providing supplemental supplies of water, providing supplemental supplies of food, providing shelters, and making census counts to determine population. A management plan developed with input from an endangered species specialist that addresses harvest restrictions and required activities must be adhered to.



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Streamside management zones are to protect or to preserve a waterway or body of water.<sup>19</sup> To qualify as this zone, the landowner must restrict harvest based on a management plan conforming to the silvicultural non-point source pollution management program developed by the Texas State Soil and Water Conservation Board. The protection is provided by restricting harvest in buffers 50 feet from each bank of a waterway or body that contains water at least 30 percent of the year. The buffers could be as wide as 200 feet from each bank depending on slope, soil, cover type, and proximity to public water supplies. Three hundred (300) well-spaced, 10 year old trees on average per acre or an average of 50 feet of basal area per acre must be maintained in the streamside management zones.

Lands qualifying for restricted-use timberland appraisal due to the existence of these zones will continue to qualify for the special appraisal as long as the qualifications are met.

### ***Harvested and Regenerated Timberlands***

On or after January 1, 2000, lands appraised under Subchapter E, Appraisal of Timberland, at the time timber was harvested which are being regenerated to the degree generally accepted in the area for commercial timberland and with the intent to produce income would qualify for restricted-use timberland appraisal. TFS has developed recommended guidelines for determining adequate reforestation that will be useful to chief appraisers.<sup>20</sup>

These guidelines recognize that reforestation is a process that begins with final harvest and may take several years to complete depending on drought and other conditions. TFS also suggests that regeneration occurs when the landowner makes substantial effort to begin the process (i.e., site preparation, purchase of seedlings, hiring contractors). Since lands qualifying for restricted use timberland are only given the special appraisal for ten years after harvest, this allows landowners the maximum benefit.

Final harvest may include clear cut, seed tree or shelter wood harvests but would not include partial harvest, thinning to reduce stocking or single-tree selection. After harvest, the land can be regenerated by planting tree seedlings or by natural regeneration. TFS recommends that adequate regeneration has occurred when at least 300 well-distributed, desirable seedlings per acre are free-to-grow within two years of being granted the special appraisal. It is possible that drought and other natural forces could delay reforestation beyond two years. A chief appraiser must exercise judgment in instances when the first or possibly successive seedling plantings are unsuccessful due to weather conditions. The landowner should demonstrate continued efforts to establish new trees.

Seed tree and shelter wood harvests allow for natural regeneration. In a seed tree harvest, only a few, carefully selected,

high quality trees are left remaining to provide seed for reforestation. A shelter wood harvest is a series of harvests in which mature trees are removed to allow early growth of new seedlings under the partial shade and protection of the remaining older trees.

In addition to the 300 tree criteria discussed above, TFS recommends slightly different guidelines depending on timberland's proximity to waterways. On bottomlands, a term used to define lowlands adjacent to streams and rivers, they recommend natural regeneration of hardwoods including oak, sweetgum, and ash. Planting hardwoods or pines is an option depending on site conditions. For uplands, TFS recommends natural regeneration be accomplished by leaving at least eight well spaced, 16 inch diameter pine trees per acre. Chemical or mechanical site preparation or chemical release is recommended. Site preparation may not be necessary in areas where the harvested stand was pine and there is limited vegetation to compete with the seedlings.

Timberlands receiving restricted-use timberland appraisal due to harvest and regeneration cease to qualify on the 10th anniversary of the date the timber was harvested. For instance, a tract of land was appraised as timberland under Chapter 23, Subchapter E of the Tax Code for the 2002 tax year. In June 2003, a final harvest of pine trees took place. In February 2004, the landowner had completed site preparation, purchased seedlings, and hired a contractor to plant the seedlings. The chief appraiser determined that the landowner had made substantial efforts towards reforestation and that the land qualified for restricted-use timberland appraisal in February 2004. Beginning with the 2004 tax year and ending with the 2013 tax year, the land will be appraised as restricted use timberland so long as it continues to qualify. Beginning in the 2014 tax year, the land would be appraised as timberland so long as it continues to qualify.

### **Application**

The application requirements and process for restricted-use timberland are very similar to those for timberland appraisal (see Page 8). Only the differences will be noted in this Chapter.

#### ***Filing Deadline***

A property owner must apply before May 1 of the tax year to receive this special appraisal. The chief appraiser may grant a 15-day extension for good cause.

#### ***Late Applications***

The amendments to the Tax Code do not allow for late application for restricted-use timberland appraisal. In order for land to qualify for this special appraisal, a valid application must be filed or a request for extension made before May 1. Valid applications received after May 1 can only be approved for the subsequent tax year.

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### ***One-Time Application***

As with timberland, owners of restricted-use timberland do not need to make a new application unless the land's eligibility changes or the chief appraiser requires a new application. See the discussion on Page 9.

### ***Notification Changes***

The landowner's responsibility to notify the chief appraiser of changes in use of the land is the same for restricted use timberland and other timberland. The significant difference is in the penalty assessed for failure to do so. For timberland, the penalty is equal to 10 percent of the difference between the taxes imposed under timber use and the taxes that would have been imposed under the new use and applies for each year the property received the incorrect appraisal but not for more than 5 years. For restricted use timberland, the penalty is 10 percent of the difference but for not more than 10 years. See the discussion on Page 9.

### ***Chief Appraisers Action***

Upon review of each application, the chief appraiser may approve the application and grant restricted use timberland appraisal, disapprove the application and ask for additional information or deny the application. These actions must follow the same procedures as for timberland, which are discussed on Page 9, with one notable exception.

### ***Denial Based on Zone Determination***

Before a chief appraiser can deny an application for restricted-use timberland appraisal based on aesthetic management, critical wildlife habitat, and or streamside management zones, the TFS must determine the validity of the zone. TFS has adopted an administrative rule governing the procedures for a chief appraiser requesting determination of a zone. The request must be made on a form prescribed by TFS and available from their office and on their Web site. Items to be attached to the request for zone determination are a copy of the application for restricted-use timberland appraisal, maps showing the site location and zone location if its location or acreage is contested, information documenting the case if the minimum 50 square feet per acre of basal area is contested, and other information in support of the district position.

If the application was received by the chief appraiser prior to April 1, the zone determination request must be submitted no later than 30 days after receipt of the application. If the application was received by the chief appraiser after April 1, the zone determination request must be submitted no later than 15 days after receipt of the application. The chief appraiser must also deliver to the applicant and each taxing unit in which the land is located a notice that a zone determination has been requested and instructions for the applicant and taxing unit to submit evidence. These notices and instructions are forms prescribed by TFS and are available from their office and on their Web site.

The TFS's determination is conclusive as to the type, size, and location of the zone. The property owner or the chief appraiser may not protest the TFS's determination to the appraisal review board or appeal it to district court.

### ***Appraisal***

The appraised value of qualified restricted-use timberland is one-half of the value that would have been determined for the land under Section 23.73(a) of the Tax Code. This section of the Tax Code refers to appraisal of qualified timberland, which is discussed in Chapter IV of this Manual. For example, a 100-acre tract of land in Newton County qualifies as timberland and is classified as Hardwood Forest Soil Type II. The landowner submits an application for restricted-use timberland appraisal after establishing a 10-acre streamside management zone and the chief appraiser approves the application. Based on the schedule of timberland values developed according to Chapter IV, Hardwood Forest Soil Type II has a per acre timberland productivity value of \$100.00. The per acre value of the 10 acres qualified for restricted-use timberland appraisal would be \$50.00 ( $\$100.00 \div 2 = \$50.00$ ). The appraised value of these 10 acres would continue to be one-half of the value determined for Hardwood Forest Soil Type II for as long as the land qualified as restricted-use timberland.

Another example would be final harvest occurs on 100 acres of a 1,000 acre tract that was classified as Mixed Forest Soil Type II. The landowner prepares the 100 acres for planting and purchases pine seedlings. A valid application for restricted use timberland is filed and approved by the chief appraiser. Since the 100 acres is now planted in pine and is being managed as a pine plantation, the tract would be classified as Pine Forest Soil Type II. Based on the timberland values developed by the chief appraiser, Pine Forest Soil Type II has a per acre value of \$386.00. The appraised value of the 100 acres qualified for restricted-use timberland appraisal would be \$193.00 per acre ( $\$386.00 \div 2 = \$193.00$ ) and would continue to be one-half of the value of Pine Forest Soil Type II for ten years from the date of harvest.

### ***Maximum Value***

The appraised value of land qualified as restricted-use timberland cannot be greater than the market value of the land or than the appraised value for the year preceding the first year the land qualified for appraisal as restricted-use timberland.

### ***1978 Value Does Not Apply***

In 1978, Texas voters adopted a constitutional amendment providing for taxable values of timberlands to be based on productivity values rather than market values. So that the taxing units would not lose revenues, the law provided that a parcel's timberland productivity value could not be less than its 1978 market value. This minimum value, found in Tax Code Section 23.78, does not apply to restricted-use timberland.

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Section 23.78, on the minimum taxable value of timberland, states: “The taxable value of qualified timber land appraised as provided by this subchapter may not be less than the appraised value of that land for the taxing unit in the 1978 tax year, . . .” The subchapter referenced is Subchapter E (Appraisal of Timber Land). Restricted-use timberland is based on Subchapter H, which does not set a minimum value.

***Change of Use and Rollback Procedures***

Changes of use do trigger “roll back taxes.” Please see Chapter III of this Manual for a thorough discussion of reasons for imposing roll back taxes, what constitutes a change of use, the

procedures for notifying landowners of the determination of a change in use, and calculating the roll back tax. There are slight differences in calculating the tax for restricted-use timberland. If land qualifying for restricted-use timberland appraisal changes to a use that qualifies as timberland, appraised under Subchapter E, the land has a rollback tax. The additional tax will be based on the difference between the restricted-use timber value and the timber value for the five preceding years. If the change is to a use that does not qualify as timberland, the additional tax will be based on the difference between the restricted-use timber value and the land’s market value for the preceding five years.

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# ENDNOTES

- <sup>1</sup> See Tax Code, Section 11.16
- <sup>2</sup> In Texas Attorney General Letter Opinion LO-88-89, the Attorney General stated that land used solely for cutting wood to build fences for ranch operations does not qualify for timber appraisal.
- <sup>3</sup> See: *HL Farms v. Self*, 877 S.W.2d 288 (Tex. 1994).
- <sup>4</sup> See *Guidelines for Qualification of Agricultural Land in Wildlife Management Use*, July 2002, Page 3.
- <sup>5</sup> In its 1992 survey of Texas timber, the USDA Forest Service used sampling methods designed to achieve reasonable sampling errors and reliable estimates at the state level. Future USDA Forest Service surveys of Texas timber may be designed to produce growth estimates that are reliable at the county level. If USDA Forest Service states that its data are reliable at the county level, the comptroller will work with appraisal districts and taxpayers to develop standards for use of county level growth data.
- <sup>6</sup> Trees free to grow are those that are not covered by brush or other trees that prevent them from getting the sunlight necessary to grow.
- <sup>7</sup> Before using soil type maps, chief appraisers should be certain that the data used to develop the maps are appropriate for classifying soil for timber appraisal purposes.
- <sup>8</sup> The site index data compiled by the Natural Resources Conservation Service show virtually no trees with a site index of 110 and above, which is the equivalent of site class 165 and above. Consequently, if the top two USDA Forest Service site classes were kept separate and the two lower site classes were combined, there would be no NRCS data for the “over 165 site class” in most of Texas.
- <sup>9</sup> The 1992 survey data are available in two publications. For southeast Texas counties, see John F. Kelly, Patrick E. Miller and Andrew J. Hartsell, *Forest Statistics for Southeast Texas Counties – 1992*, USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA. Resource Bulletin SO-172, Nov. 1992. For northeast Texas Counties, see John F. Kelly, Patrick E. Miller and Andrew J. Hartsell, *Forest Statistics for Northeast Texas Counties – 1992*, USDA Forest Service, Southern Forest Experiment Station, New Orleans, LA. Resource Bulletin SO-171, Nov. 1992. When the USDA Forest Service revises the published data, it makes the revisions available to the Texas Forest Service for distribution upon request. Before using any of the Texas survey data, chief appraisers should check with the USDA Forest Service, Southern Forest Experiment Station, Forest Inventory and Analysis Unit in Starkville, Mississippi, or the Texas Forest Service in College Station for revisions.
- <sup>10</sup> The Texas Forest Service, located in College Station, maintains Texas Forest survey data collected by the USDA Forest Service.
- <sup>11</sup> Effective January 1, 2004, the Tax Code was amended to change the definition of net-to-land for timberland to specify that growth and stumpage values were to be expressed in tons rather than cords or board feet and were to include “large pine sawtimber, small pine sawtimber, pine pulpwood, hardwood sawtimber, hardwood pulpwood, and any other significant timber product.”
- <sup>12</sup> A “plot” is an area defined by the USDA Forest Service for its survey work.
- <sup>13</sup> There are dozens of recognized log rules in use in the United States, and each is based on various assumptions about tree taper, lumber shrinkage, cutting methods, and waste. The two log rules that are of interest to the chief appraiser are the International one-fourth inch—used by the USDA Forest Service—and the Doyle log rule, used by the Texas Forest Service.
- <sup>14</sup> Stumpage price is the terminology used to indicate the price of uncut, marketable timber.
- <sup>15</sup> The Texas Forest Service also provides summaries of average annual stumpage prices of various forest products for various years. It does not provide data at the county level.
- <sup>16</sup> Although the Tax Code, Section 23.51(4), allows the chief appraiser to include “any income received from hunting or recreational leases” in the computation of net income of qualified agricultural land, nothing in the Tax Code’s sections (23.71-23.79) governing timber appraisal allows inclusion of lease income in the computation of net income of qualified timberland.
- <sup>17</sup> See: Stephen G. Boyce, Joe P. McClure and Herbert S. Sternitzke, *Biological Potential for the Loblolly Pine Ecosystem East of the Mississippi River*; USDA Forest Service, Southeastern Forest Experiment Station, Ashville, NC. Research Paper SE-142, Oct. 1975.
- <sup>18</sup> See Chapter 215, Texas Administrative Code.
- <sup>19</sup> Texas Forest Service Rule 215.1 identifies these bodies of water as intermittent and perennial streams, rivers, lakes, sloughs, ponds, creeks, reservoirs, watersheds or wetlands. Intermittent streams flow only during wet periods of the year, 30 to 90 percent of the time, and flow in a continuous, well-defined channel. Perennial streams flow through the majority of the year in a well-defined channel. Ephemeral streams, which are excluded, only flow during short periods following precipitation in low areas or in channels that are not well defined.
- <sup>20</sup> These guidelines and additional information regarding zone determination are available from the Texas Forest Service and on their Web site.



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## APPENDIX A.

# Data Sources

Chief appraisers are solely responsible for determining timber productivity values within their respective appraisal districts. To do so, they must obtain information on forest types, soil types, timber growth, and forest product prices from sources listed in the Tax Code. While the following sources provide information on which to base determinations, the chief appraiser bears ultimate responsibility for determining timberland productivity value.

### ***United States Department of Agriculture (USDA)***

#### ***Natural Resources Conservation Service (NRCS)***

The NRCS is the federal agency charged with inventorying and classifying the nation's soils. This agency has detailed soil surveys of Texas timber-producing counties that show the potential productivity and site index of common trees in each soil series that is suitable for growing commercial trees. This information may be used to generate soil productivity maps.

#### ***United States Department of Agriculture Forest Service***

The USDA Forest Service is a branch of the United States Department of Agriculture. The Texas Forest Service collects voluminous information about average timber growth and forest characteristics in **East** Texas timber counties as part of the Forest Inventory and Analysis. The USDA Forest Service publishes the results of these surveys.

#### ***Texas Forest Service (TFS)***

The Texas Forest Service (TFS) is a state agency and has branch offices throughout the state's timber region. TFS

foresters help timber growers prepare management plans, giving priority to those with long-term timber production goals who are interested in using approved management practices, including cost-sharing. TFS headquarters are located in College Station, where the agency publishes a bi-monthly report of timber stumpage prices, called *Texas Timber Price Trends*. In addition, TFS publishes an annual report of timber harvests called *Harvest Trends*. This publication shows harvest information for each product and for each timber-producing county in Texas. Finally, the TFS has data about timber growth that the agency develops in cooperation with the United States Department of Agriculture Forest Service.

#### ***Universities and colleges***

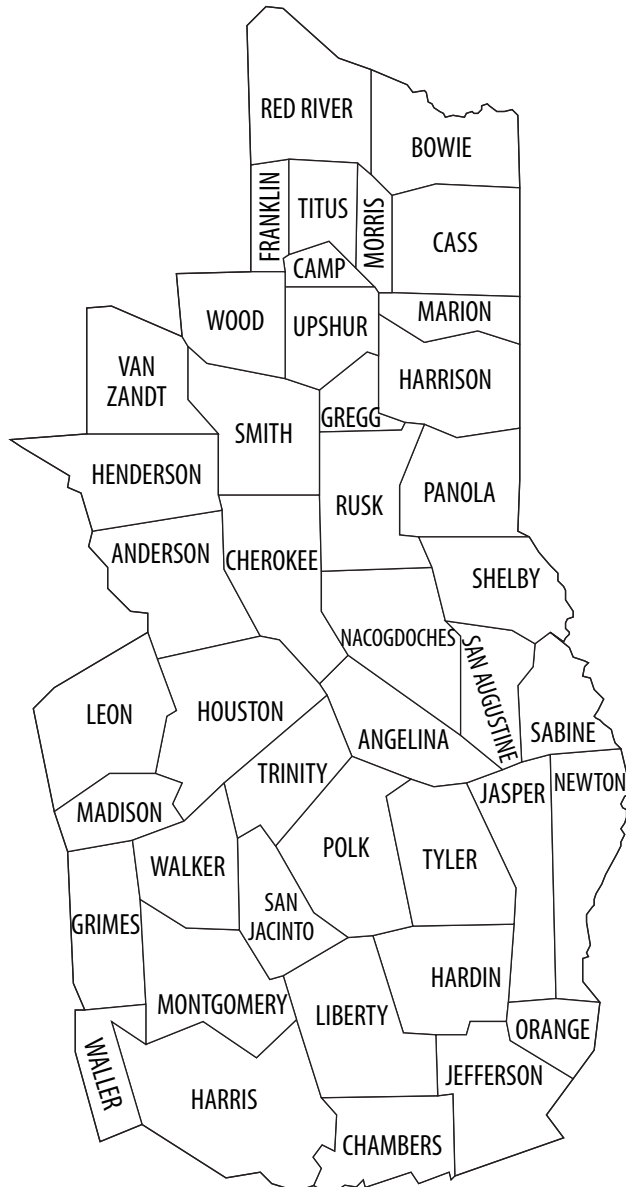
The College of Forestry at Stephen F. Austin State University in Nacogdoches, the Department of Forest Science at Texas A&M University in College Station and other Texas colleges of forestry and universities with forest science departments often have research-based information unavailable from other sources. For example, personnel at the Texas Agricultural Experiment Station at Texas A&M University have developed forest type maps and soil productivity maps using United States Geological Survey maps and USDA Natural Resources Conservation Service data, respectively. These maps are available upon request for a nominal fee to cover reproduction costs.



APPENDIX B.

# Figures and Tables

**FIGURE 1.**  
**Forest Region in Texas**





**TABLE 1.**  
**Net Average Annual Growth Per Acre by Forest Type**  
**and Site Class for Private Timberland**

Forest Type	Site Class	Number of Plots	Average Large Pine Sawtimber Growth/Acre (Board Feet)*	Average Small Pine Sawtimber Growth/Acre (Board Feet)*	Average Hardwood Sawtimber Growth/Acre (Board Feet)*	Average Pine Pulpwood Growth/Acre (Cubic Feet)*	Average Hardwood Pulpwood Growth/Acre (Board Feet)*
Pine	120+	220	317.43	111.37	18.82	19.36	3.36
	85-120	300	170.55	119.56	13.69	38.94	3.46
	50-85	125	93.44	94.12	8.04	31.79	3.08
	<50	8	2.19	50.40	-2.03	12.28	-0.62
Mixed	120+	131	200.18	58.76	69.64	10.35	9.76
	85-120	196	125.87	62.05	37.48	9.43	6.48
	50-85	71	67.22	73.75	30.99	12.50	3.02
	<50	4	30.39	104.19	1.87	12.84	20.96
Hardwood	120+	216	86.94	22.01	129.80	2.14	10.43
	85-120	270	40.87	30.02	81.03	2.48	12.20
	50-85	247	16.78	12.09	71.56	2.68	10.81
	<50	86	4.49	1.43	57.57	1.17	12.73

**TABLE 2. Calculation of Average Annual Growth, Per Acre, by Forest Type and Forest Product**

**FOREST TYPE: PINE**

Site Class	Number of Plots	Large Pine Sawtimber		Small Pine Sawtimber		Hardwood Sawtimber		Pine Pulpwood		Hardwood Pulpwood	
		Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class
120 +	220	317.43	69,834.60	111.37	24,501.40	18.82	4,140.00	19.36	4,258.85	3.36	738.80
85-120	300	170.55	51,165.00	119.56	35,868.00	13.69	4,105.80	38.94	11,682.90	3.46	1,038.90
50-84	125	93.44	11,680.00	94.12	11,765.00	8.04	1,004.63	31.79	3,973.79	3.08	384.62
<50	8	2.19	17.52	50.40	403.20	-2.03	-16.24	12.28	98.21	-0.62	-4.97
Totals	653		132,697.12		72,537.60		9,234.19		20,013.75		2,157.35
			÷ 653		÷ 653		÷ 653		÷ 653		÷ 653
			= 203.21 bd. ft.		= 111.08 bd. ft.		= 14.14 bd. ft.		= 30.65 cu. ft.		= 3.30 cu. ft.

**FOREST TYPE: MIXED**

Site Class	Number of Plots	Large Pine Sawtimber		Small Pine Sawtimber		Hardwood Sawtimber		Pine Pulpwood		Hardwood Pulpwood	
		Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class
120 +	131	200.18	26,223.58	58.76	7,697.56	69.64	9,122.19	10.35	1,355.60	9.76	1,278.27
85-120	196	125.87	24,670.52	62.05	12,161.80	37.48	7,346.26	9.43	1,848.82	6.48	1,269.70
50-84	71	67.22	4,772.62	73.75	5,236.25	30.99	2,200.34	12.50	887.31	3.02	214.34
<50	4	30.39	121.56	104.19	416.76	1.87	7.48	12.84	51.36	20.96	83.82
Totals	402		55,788.28		25,512.37		18,676.27		4,143.09		2,846.13
			÷ 402		÷ 402		÷ 402		÷ 402		÷ 402
			= 138.78 bd. ft.		= 63.46 bd. ft.		= 46.46 bd. ft.		= 10.31 cu. ft.		= 7.08 cu. ft.

**FOREST TYPE: HARDWOOD**

Site Class	Number of Plots	Large Pine Sawtimber		Small Pine Sawtimber		Hardwood Sawtimber		Pine Pulpwood		Hardwood Pulpwood	
		Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (board feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class	Average Growth/Acre (cubic feet)*	Total Growth per Site Class
120 +	216	86.64	18,714.24	22.01	4,754.16	129.80	28,037.32	2.14	461.36	10.43	2,252.00
85-120	270	40.87	11,034.90	30.02	8,105.40	81.03	21,878.11	2.48	669.64	12.20	3,294.49
50-84	247	16.78	4,144.66	12.09	2,986.23	71.56	17,674.55	2.68	662.22	10.81	2,670.38
<50	86	4.49	386.14	1.43	122.98	57.57	4,951.14	1.17	100.23	12.73	1,095.03
Totals	819		34,279.94		15,968.77		72,541.12		1,893.45		9,311.90
			÷ 819		÷ 819		÷ 819		÷ 819		÷ 819
			= 41.86 bd. ft.		= 19.50 bd. ft.		= 88.57 bd. ft.		= 2.31 cu. ft.		= 11.37 cu. ft.

**TABLE 3.**  
**Average Annual Timber Growth, Measured in Terms of Forest Products,**  
**on an Average Acre of Timber, by Forest Type**

Forest Type	Board Feet* per Acre per Year			Cubic Feet per Acre per Year	
	Large Pine Sawtimber	Small Pine Sawtimber	Hardwood Sawtimber	Pine Pulpwood	Hardwood Pulpwood
Pine	203.21	111.08	14.14	30.65	3.30
Mixed	138.78	63.46	46.46	10.31	7.08
Hardwood	41.86	19.50	88.57	2.31	11.37

\* Million board feet are expressed in terms of International 1/4 inch log rule.

**TABLE 4.**  
**Calculation of the Weighted Conversion Factors**  
**Used to Change the Volume of Large Pine Sawtimber and Hardwood Sawtimber**  
**Measured in International 1/4 inch Log Rule to Doyle Log Rule**

Diameter Class	Volume in Million bd. ft. International 1/4" Log Rule	Total Volume	Percent of Total Volume	Conversion Factor	Weighted Contribution
<b>PINE</b>					
11 - 12.9	5,195.1	÷ 24,003.10	= 21.64%	x 0.4904	x 0.10612
13 - 14.9	5,365.1	÷ 24,003.10	= 22.35%	x 0.5246	x 0.11725
15 - 16.9	4,855.0	÷ 24,003.10	= 20.23%	x 0.5912	x 0.11960
17 - 18.9	3,468.3	÷ 24,003.10	= 14.45%	x 0.6527	x 0.09432
19 - 20.9	2,136.7	÷ 24,003.10	= 8.90%	x 0.7065	x 0.06288
21 - 28.9	2,629.3	÷ 24,003.10	= 10.95%	x 0.8115	x 0.08886
29+	353.6	÷ 24,003.10	= 1.47%	x 0.9218	x 0.01355
	24,003.10		99.99%		0.60258
Weighted Conversion Factor for Large Pine Sawtimber = 0.60258					
<b>HARDWOOD</b>					
11 - 12.9	2,428.4	÷ 14,434.50	= 16.82%	x 0.4638	x 0.07801
13 - 14.9	2,868.1	÷ 14,434.50	= 19.87%	x 0.5292	x 0.10516
15 - 16.9	2,454.5	÷ 14,434.50	= 17.00%	x 0.5913	x 0.10052
17 - 18.9	2,080.3	÷ 14,434.50	= 14.41%	x 0.6460	x 0.09309
19 - 20.9	1,525.6	÷ 14,434.50	= 10.57%	x 0.6933	x 0.07328
21 - 28.9	2,571.3	÷ 14,434.50	= 17.81%	x 0.7841	x 0.13965
29+	506.3	÷ 14,434.50	= 3.51%	x 0.8732	x 0.03065
	14,434.5		99.99%		0.62036
Weighted Conversion Factor for Hardwood Sawtimber = 0.62036					

Volume Data from United States Forest Service, Forest Inventory and Analysis  
Conversion Factors for International 1/4 Inch Log Rule to Doyle Log Rule from Mississippi State Study conducted by Thomas Matney  
Conversion Factors for Doyle Log Rule to Tons from Texas Forest Service

**TABLE 5.  
Converting Sawtimber Volumes Measured in International 1/4 Inch Rule to Doyle Rule  
and Pulpwood Cubic Foot Volumes to Cords, by Forest Type**

FOREST TYPE: PINE													
Forest Product	MBF International 1/4" Rule		Weighted Doyle Conversion Factor	=	MBF Doyle Rule	÷	MBF Conversion	=	Growth in Board Feet	x	Ton Conversion Factor	=	Growth In Tons
Large Pine Sawtimber	203.21	x	0.60258	=	122.45	÷	1,000	=	0.12245	x	8.0000	=	0.9796
Hardwood Sawtimber	14.14	x	0.62036	=	8.77	÷	1,000	=	0.00877	x	9.0000	=	0.0789
			Cubic Feet		MBF International 1/4" Rule		Cord Conversion Factor		Growth in Cords		Ton Conversion Factor		Growth In Tons
Small Pine Sawtimber					111.08	÷	500	=	0.22216	x	2.6250	=	0.5832
Pine Pulpwood			30.65			÷	81	=	0.37840	x	2.5625	=	0.9697
Hardwood Pulpwood			3.30			÷	80	=	0.04125	x	2.8000	=	0.1155
FOREST TYPE: MIXED													
Forest Product	MBF International 1/4" Rule		Weighted Doyle Conversion Factor	=	MBF Doyle Rule	÷	MBF Conversion	=	Growth in Board Feet	x	Ton Conversion Factor	=	Growth In Tons
Pine Sawtimber	138.78	x	0.60258	=	83.63	÷	1,000	=	0.08363	x	8.0000	=	0.6690
Hardwood Sawtimber	46.46	x	0.62036	=	28.82	÷	1,000	=	0.02882	x	9.0000	=	0.2594
			Cubic Feet		MBF International 1/4" Rule		Cord Conversion Factor		Growth in Cords		Ton Conversion Factor		Growth In Tons
Small Pine Sawtimber					63.46	÷	500	=	0.12692	x	2.6250	=	0.3332
Pine Pulpwood			10.31			÷	81	=	0.12728	x	2.5625	=	0.3262
Hardwood Pulpwood			7.08			÷	80	=	0.08850	x	2.8000	=	0.2478
FOREST TYPE: HARDWOOD													
Forest Product	MBF International 1/4" Rule		Weighted Doyle Conversion Factor	=	MBF Doyle Rule	÷	MBF Conversion	=	Growth in Board Feet	x	Ton Conversion Factor	=	Growth In Tons
Pine Sawtimber	41.86	x	0.60258	=	25.22	÷	1,000	=	0.02522	x	8.0000	=	0.2018
Hardwood Sawtimber	88.57	x	0.62036	=	54.95	÷	1,000	=	0.05495	x	9.0000	=	0.4946
			Cubic Feet		MBF International 1/4" Rule		Cord Conversion Factor		Growth in Cords		Ton Conversion Factor		Growth In Tons
Small Pine Sawtimber					19.50	÷	500	=	0.03900	x	2.6250	=	0.1024
Pine Pulpwood			2.31			÷	81	=	0.02852	x	2.5625	=	0.0731
Hardwood Pulpwood			11.37			÷	80	=	0.14213	x	2.8000	=	0.3980

Conversion Factors for International 1/4 Inch Log Rule to Doyle Log Rule from Mississippi State Study conducted by Thomas Matney  
Conversion Factors for Doyle Log Rule to Tons from Texas Forest Service

**TABLE 6.**  
**Average Annual Timber Growth, Measured in Tons Per Acre Per Year,**  
**by Forest Type and Forest Product**

Forest Type	Large Pine Sawtimber	Small Pine Sawtimber	Hardwood Sawtimber	Pine Pulpwood	Hardwood Pulpwood
Pine	0.9796	0.5832	0.0789	0.9697	0.1155
Mixed	0.6690	0.3332	0.2594	0.3262	0.2478
Hardwood	0.2018	0.1024	0.4946	0.0731	0.3980

**TABLE 7.**  
**Average Stumpage Prices Measured in Price Per Ton**  
**for Forest Products, 1998 – 2002**

Year	Large Pine Sawtimber			Small Pine Sawtimber			Hardwood Sawtimber		
	Unweighted Average Prices	Weighted Average Prices	Average of Unweighted and Weighted Prices	Unweighted Average Prices	Weighted Average Prices	Average of Unweighted and Weighted Prices	Unweighted Average Prices	Weighted Average Prices	Average of Unweighted and Weighted Prices
1998	\$44.94	\$46.40	\$45.67	\$21.27	\$22.33	\$21.80	\$14.64	\$15.42	\$15.03
1999	\$41.73	\$42.29	\$42.01	\$20.02	\$19.90	\$19.96	\$14.65	\$15.49	\$15.07
2000	\$38.93	\$39.65	\$39.29	\$18.41	\$16.95	\$17.68	\$13.38	\$13.43	\$13.41
2001	\$38.54	\$38.12	\$38.33	\$15.11	\$15.67	\$15.39	\$13.19	\$13.37	\$13.28
2002	\$37.43	\$41.03	\$39.23	\$19.43	\$16.41	\$17.92	\$14.84	\$17.36	\$16.10

Year	Pine Pulpwood			Hardwood Pulpwood		
	Unweighted Average Prices	Weighted Average Prices	Average of Unweighted and Weighted Prices	Unweighted Average Prices	Weighted Average Prices	Average of Unweighted and Weighted Prices
1998	\$14.48	\$14.82	\$14.65	\$9.99	\$9.79	\$9.89
1999	\$11.47	\$11.05	\$11.26	\$9.02	\$9.07	\$9.05
2000	\$8.18	\$8.33	\$8.26	\$8.95	\$9.12	\$9.04
2001	\$6.51	\$5.79	\$6.15	\$9.56	\$9.84	\$9.70
2002	\$4.45	\$4.84	\$4.65	\$4.37	\$5.28	\$4.83

Unweighted averages are arithmetic means of reported transactions.

Weighted averages are equal to the total value of reported transactions divided by the total volume of reported transactions.

Source: Texas Forest Service

**TABLE 8.**  
**Calculation of the Annual Average Gross Income of an Acre of Timber Growth, by Forest Type**

PINE																					
Sawtimber Growth (tons)										Pulp Growth (tons)				Average Annual Gross Income							
Year	Large Pine	x	Price**	+	Small Pine	x	Price**	+	Hardwood	x	Price**	+	Pine	x	Price**	+	Hardwood	x	Price**	=	
1998	(0.9796	x	\$45.67)	+	(0.5832	x	\$21.80)	+	(0.0789	x	\$15.03)	+	(0.9697	x	\$14.65)	+	(0.1155	x	\$9.89)	=	\$73.99
1999	(0.9796	x	\$42.01)	+	(0.5832	x	\$19.96)	+	(0.0789	x	\$15.07)	+	(0.9697	x	\$11.26)	+	(0.1155	x	\$9.05)	=	\$65.95
2000	(0.9796	x	\$39.29)	+	(0.5832	x	\$17.68)	+	(0.0789	x	\$13.41)	+	(0.9697	x	\$8.26)	+	(0.1155	x	\$9.04)	=	\$58.91
2001	(0.9796	x	\$38.33)	+	(0.5832	x	\$15.39)	+	(0.0789	x	\$13.28)	+	(0.9697	x	\$6.15)	+	(0.1155	x	\$9.70)	=	\$54.66
2002	(0.9796	x	\$39.23)	+	(0.5832	x	\$17.92)	+	(0.0789	x	\$16.10)	+	(0.9697	x	\$4.65)	+	(0.1155	x	\$4.83)	=	\$55.22
MIXED																					
Sawtimber Growth (tons)										Pulp Growth (tons)				Average Annual Gross Income							
Year	Large Pine	x	Price**	+	Small Pine	x	Price**	+	Hardwood	x	Price**	+	Pine	x	Price**	+	Hardwood	x	Price**	=	
1998	(0.6690	x	\$45.67)	+	(0.3332	x	\$21.80)	+	(0.2594	x	\$15.03)	+	(0.3262	x	\$14.65)	+	(0.2478	x	\$9.89)	=	\$48.95
1999	(0.6690	x	\$42.01)	+	(0.3332	x	\$19.96)	+	(0.2594	x	\$15.07)	+	(0.3262	x	\$11.26)	+	(0.2478	x	\$9.05)	=	\$44.58
2000	(0.6690	x	\$39.29)	+	(0.3332	x	\$17.68)	+	(0.2594	x	\$13.41)	+	(0.3262	x	\$8.26)	+	(0.2478	x	\$9.04)	=	\$40.59
2001	(0.6690	x	\$38.33)	+	(0.3332	x	\$15.39)	+	(0.2594	x	\$13.28)	+	(0.3262	x	\$6.15)	+	(0.2478	x	\$9.70)	=	\$38.63
2002	(0.6690	x	\$39.23)	+	(0.3332	x	\$17.92)	+	(0.2594	x	\$16.10)	+	(0.3262	x	\$4.65)	+	(0.2478	x	\$4.83)	=	\$39.11
HARDWOOD																					
Sawtimber Growth (tons)										Pulp Growth (tons)				Average Annual Gross Income							
Year	Large Pine	x	Price**	+	Small Pine	x	Price**	+	Hardwood	x	Price**	+	Pine	x	Price**	+	Hardwood	x	Price**	=	
1998	(0.2018	x	\$45.67)	+	(0.1024	x	\$21.80)	+	(0.4946	x	\$15.03)	+	(0.0731	x	\$14.65)	+	(0.3980	x	\$9.89)	=	\$23.89
1999	(0.2018	x	\$42.01)	+	(0.1024	x	\$19.96)	+	(0.4946	x	\$15.07)	+	(0.0731	x	\$11.26)	+	(0.3980	x	\$9.05)	=	\$22.40
2000	(0.2018	x	\$39.29)	+	(0.1024	x	\$17.68)	+	(0.4946	x	\$13.41)	+	(0.0731	x	\$8.26)	+	(0.3980	x	\$9.04)	=	\$20.57
2001	(0.2018	x	\$38.33)	+	(0.1024	x	\$15.39)	+	(0.4946	x	\$13.28)	+	(0.0731	x	\$6.15)	+	(0.3980	x	\$9.70)	=	\$20.19
2002	(0.2018	x	\$39.23)	+	(0.1024	x	\$17.92)	+	(0.4946	x	\$16.10)	+	(0.0731	x	\$4.65)	+	(0.3980	x	\$4.83)	=	\$19.98

\* From Table 5

\*\* From Table 7

**TABLE 9. Calculation of the Potential Growth of an Average Acre of Timber**

County	Number of Privately-Owned Acres (000's) by Site Class					
	165+	120-165	85-120	50-85	<50	All Classes
Anderson	15.3	101.8	76.4	122.2	25.5	341.2
Angelina	13.1	130.8	130.8	52.3	0.0	327.0
Bowie	10.5	36.6	94.1	52.3	15.7	209.2
Camp	0.0	16.0	8.0	24.0	0.0	48.0
Cass	11.7	123.1	158.3	123.1	0.0	416.2
Chambers	0.0	0.0	8.6	0.0	0.0	8.6
Cherokee	41.1	164.5	129.2	52.9	5.9	393.6
Franklin	0.0	7.8	31.1	15.6	0.0	54.5
Gregg	7.2	14.5	28.9	28.9	0.0	79.5
Grimes	0.0	30.8	24.6	86.3	12.3	154.0
Hardin	17.3	103.7	224.8	86.5	17.3	449.6
Harris	11.6	29.0	69.7	121.9	5.8	238.0
Harrison	27.9	117.2	161.9	67.0	0.0	374.0
Henderson	0.0	11.1	22.2	88.8	77.7	199.8
Houston	10.8	64.8	145.8	64.8	5.4	291.6
Jasper	37.3	118.0	186.4	130.5	12.4	484.6
Jefferson	5.6	5.6	50.1	11.1	0.0	72.4
Leon	0.0	11.0	33.1	60.6	170.9	275.6
Liberty	42.8	85.6	96.3	133.8	21.4	379.9
Madison	0.0	6.7	26.7	40.1	13.4	86.9
Marion	0.0	103.6	90.6	12.9	0.0	207.1
Montgomery	26.3	94.8	205.4	57.9	21.1	405.5
Morris	0.0	25.7	19.2	32.1	0.0	77.0
Nacogdoches	35.3	129.4	141.1	58.8	0.0	364.6
Newton	36.9	142.3	226.6	105.4	15.8	527.0
Orange	5.5	38.6	71.7	11.0	0.0	126.8
Panola	30.6	91.9	159.4	42.9	12.3	337.1
Polk	11.6	144.5	265.8	104.0	11.6	537.5
Red River	0.0	40.5	86.7	138.7	28.9	294.8
Rusk	26.6	168.3	62.0	70.9	8.9	336.7
Sabine	9.6	76.7	81.5	14.4	0.0	182.2
San Augustine	18.4	73.7	116.8	12.3	0.0	221.2
San Jacinto	0.0	56.1	112.1	49.8	0.0	218.0
Shelby	27.2	95.3	129.3	47.6	0.0	299.4
Smith	0.0	18.7	106.1	99.8	25.0	249.6
Titus	0.0	36.5	26.0	26.0	0.0	88.5
Trinity	33.2	19.9	126.2	106.2	0.0	285.5
Tyler	17.3	121.3	283.0	69.3	5.8	496.7
Upshur	11.8	58.9	123.7	29.5	0.0	223.9
Van Zandt	0.0	6.9	27.6	27.6	34.5	96.6
Walker	0.0	56.3	146.4	39.4	11.3	253.4
Waller	0.0	5.9	41.6	23.8	0.0	71.3
Wood	0.0	28.6	114.3	62.9	0.0	205.8
<b>All Counties</b>	<b>542.5</b>	<b>2,813.0</b>	<b>4,470.1</b>	<b>2,605.9</b>	<b>558.9</b>	<b>10,990.4</b>



**TABLE 9. Calculation of the Potential Growth of an Average Acre of Timber, East Texas (continued)**

Growth Potentials	Potential Cu. Ft. Growth x Number of Acres (000's)					Total
	163	163	123	85	60	
County / Soil Type	165+	120-165	85-120	50-85	<50	
Anderson	2,493.9	16,593.4	9,397.2	10,387.0	1,530.0	40,401.5
Angelina	2,135.3	21,320.4	16,088.4	4,445.5	0.0	43,989.6
Bowie	1,711.5	5,965.8	11,574.3	4,445.5	942.0	24,639.1
Camp	0.0	2,608.0	984.0	2,040.0	0.0	5,632.0
Cass	1,907.1	20,065.3	19,470.9	10,463.5	0.0	51,906.8
Chambers	0.0	0.0	1,057.8	0.0	0.0	1,057.8
Cherokee	6,699.3	26,813.5	15,891.6	4,496.5	354.0	54,254.9
Franklin	0.0	1,271.4	3,825.3	1,326.0	0.0	6,422.7
Gregg	1,173.6	2,363.5	3,554.7	2,456.5	0.0	9,548.3
Grimes	0.0	5,020.4	3,025.8	7,335.5	738.0	16,119.7
Hardin	2,819.9	16,903.1	27,650.4	7,352.5	1,038.0	55,763.9
Harris	1,890.8	4,727.0	8,573.1	10,361.5	348.0	25,900.4
Harrison	4,547.7	19,103.6	19,913.7	5,695.0	0.0	49,260.0
Henderson	0.0	1,809.3	2,730.6	7,548.0	4,662.0	16,749.9
Houston	1,760.4	10,562.4	17,933.4	5,508.0	324.0	36,088.2
Jasper	6,079.9	19,234.0	22,927.2	11,092.5	744.0	60,077.6
Jefferson	912.8	912.8	6,162.3	943.5	0.0	8,931.4
Leon	0.0	1,793.0	4,071.3	5,151.0	10,254.0	21,269.3
Liberty	6,976.4	13,952.8	11,844.9	11,373.0	1,284.0	45,431.1
Madison	0.0	1,092.1	3,284.1	3,408.5	804.0	8,588.7
Marion	0.0	16,886.8	11,143.8	1,096.5	0.0	29,127.1
Montgomery	4,286.9	15,452.4	25,264.2	4,921.5	1,266.0	51,191.0
Morris	0.0	4,189.1	2,361.6	2,728.5	0.0	9,279.2
Nacogdoches	5,753.9	21,092.2	17,355.3	4,998.0	0.0	49,199.4
Newton	6,014.7	23,194.9	27,871.8	8,959.0	948.0	66,988.4
Orange	896.5	6,291.8	8,819.1	935.0	0.0	16,942.4
Panola	4,987.8	14,979.7	19,606.2	3,646.5	738.0	43,958.2
Polk	1,890.8	23,553.5	32,693.4	8,840.0	696.0	67,673.7
Red River	0.0	6,601.5	10,664.1	11,789.5	1,734.0	30,789.1
Rusk	4,335.8	27,432.9	7,626.0	6,026.5	534.0	45,955.2
Sabine	1,564.8	12,502.1	10,024.5	1,224.0	0.0	25,315.4
San Augustine	2,999.2	12,013.1	14,366.4	1,045.5	0.0	30,424.2
San Jacinto	0.0	9,144.3	13,788.3	4,233.0	0.0	27,165.6
Shelby	4,433.6	15,533.9	15,903.9	4,046.0	0.0	39,917.4
Smith	0.0	3,048.1	13,050.3	8,483.0	1,500.0	26,081.4
Titus	0.0	5,949.5	3,198.0	2,210.0	0.0	11,357.5
Trinity	5,411.6	3,243.7	15,522.6	9,027.0	0.0	33,204.9
Tyler	2,819.9	19,771.9	34,809.0	5,890.5	348.0	63,639.3
Upshur	1,923.4	9,600.7	15,215.1	2,507.5	0.0	29,246.7
Van Zandt	0.0	1,124.7	3,394.8	2,346.0	2,070.0	8,935.5
Walker	0.0	9,176.9	18,007.2	3,349.0	678.0	31,211.1
Waller	0.0	961.7	5,116.8	2,023.0	0.0	8,101.5
Wood	0.0	4,661.8	14,058.9	5,346.5	0.0	24,067.2
<b>All Counties</b>	<b>89,675.5</b>	<b>458,519.0</b>	<b>549,822.3</b>	<b>221,501.5</b>	<b>33,534.0</b>	<b>1,351,804.3</b>
<b>1,351,804.3 ÷ 10,990.4 = 123.00 cubic feet per acre per year</b>						

Data from the United States Forest Service  
 Growth potentials based on the 1975 Boyce Study

**TABLE 10.**  
**Calculation of Soil Productivity Multipliers**

Soil Productivity Class	Average Maximum Potential Productivity in Southern United States (cu. ft. / acre / yr.)	/	Average Maximum Potential Productivity (cu. ft. / acre / yr.)	=	Productivity Multiplier
I	163	/	123.00	=	1.33
II	123	/	123.00	=	1.00
III	85	/	123.00	=	.69
IV	60	/	123.00	=	.49

*Source: Average Maximum Potential Productivity from Boyce Study*

**TABLE 11. Calculation of Average Annual Potential Growth Income by Forest Type and Soil Productivity Class**

PINE													
Soil Productivity Class	I			II			III			IV			
	Year	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income
	1998	\$73.99	x 1.33 =	\$98.41	\$73.99	x 1.00 =	\$73.99	\$73.99	x 0.69 =	\$51.05	\$73.99	x 0.49 =	\$36.26
	1999	\$65.95	x 1.33 =	\$87.71	\$65.95	x 1.00 =	\$65.95	\$65.95	x 0.69 =	\$45.51	\$65.95	x 0.49 =	\$32.32
	2000	\$58.91	x 1.33 =	\$78.35	\$58.91	x 1.00 =	\$58.91	\$58.91	x 0.69 =	\$40.65	\$58.91	x 0.49 =	\$28.87
	2001	\$54.66	x 1.33 =	\$72.70	\$54.66	x 1.00 =	\$54.66	\$54.66	x 0.69 =	\$37.72	\$54.66	x 0.49 =	\$26.78
	2002	\$55.22	x 1.33 =	\$73.44	\$55.22	x 1.00 =	\$55.22	\$55.22	x 0.69 =	\$38.10	\$55.22	x 0.49 =	\$27.06
MIXED													
Soil Productivity Class	I			II			III			IV			
	Year	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income
	1998	\$48.95	x 1.33 =	\$65.10	\$48.95	x 1.00 =	\$48.95	\$48.95	x 0.69 =	\$33.78	\$48.95	x 0.49 =	\$23.99
	1999	\$44.58	x 1.33 =	\$59.29	\$44.58	x 1.00 =	\$44.58	\$44.58	x 0.69 =	\$30.76	\$44.58	x 0.49 =	\$21.84
	2000	\$40.59	x 1.33 =	\$53.98	\$40.59	x 1.00 =	\$40.59	\$40.59	x 0.69 =	\$28.01	\$40.59	x 0.49 =	\$19.89
	2001	\$38.63	x 1.33 =	\$51.38	\$38.63	x 1.00 =	\$38.63	\$38.63	x 0.69 =	\$26.65	\$38.63	x 0.49 =	\$18.93
	2002	\$39.11	x 1.33 =	\$52.02	\$39.11	x 1.00 =	\$39.11	\$39.11	x 0.69 =	\$26.99	\$39.11	x 0.49 =	\$19.16
HARDWOOD													
Soil Productivity Class	I			II			III			IV			
	Year	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income	Gross Income	Prod. Mult.	Potential Gross Income
	1998	\$23.89	x 1.33 =	\$31.77	\$23.89	x 1.00 =	\$23.89	\$23.89	x 0.69 =	\$16.48	\$23.89	x 0.49 =	\$11.71
	1999	\$22.40	x 1.33 =	\$29.79	\$22.40	x 1.00 =	\$22.40	\$22.40	x 0.69 =	\$15.46	\$22.40	x 0.49 =	\$10.98
	2000	\$20.57	x 1.33 =	\$27.36	\$20.57	x 1.00 =	\$20.57	\$20.57	x 0.69 =	\$14.19	\$20.57	x 0.49 =	\$10.08
	2001	\$20.19	x 1.33 =	\$26.85	\$20.19	x 1.00 =	\$20.19	\$20.19	x 0.69 =	\$13.93	\$20.19	x 0.49 =	\$9.89
	2002	\$19.98	x 1.33 =	\$26.57	\$19.98	x 1.00 =	\$19.98	\$19.98	x 0.69 =	\$13.79	\$19.98	x 0.49 =	\$9.79

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**TABLE 12.**  
**Average Annual Timber Production Costs**

Year	Production Cost
1998	\$36.67
1999	\$38.87
2000	\$39.46
2001	\$36.98
2002	\$38.38

**TABLE 13. Production Costs Adjusted for Soil Productivity by Forest Type and Soil Productivity Class**

PINE																				
Soil Productivity Class	I			II			III			IV										
	Year	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost							
1998	\$36.67	x	1.20	=	\$44.00	\$36.67	x	1.00	=	\$36.67	\$36.67	x	0.80	=	\$29.34	\$36.67	x	0.35	=	\$12.83
1999	\$38.87	x	1.20	=	\$46.64	\$38.87	x	1.00	=	\$38.87	\$38.87	x	0.80	=	\$31.10	\$38.87	x	0.35	=	\$13.60
2000	\$39.46	x	1.20	=	\$47.35	\$39.46	x	1.00	=	\$39.46	\$39.46	x	0.80	=	\$31.57	\$39.46	x	0.35	=	\$13.81
2001	\$36.98	x	1.20	=	\$44.38	\$36.98	x	1.00	=	\$36.98	\$36.98	x	0.80	=	\$29.58	\$36.98	x	0.35	=	\$12.94
2002	\$38.38	x	1.20	=	\$46.05	\$38.38	x	1.00	=	\$38.38	\$38.38	x	0.80	=	\$30.70	\$38.38	x	0.35	=	\$13.43
MIXED																				
Soil Productivity Class	I			II			III			IV										
	Year	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost							
1998	\$36.67	x	0.75	=	\$27.50	\$36.67	x	0.60	=	\$22.00	\$36.67	x	0.50	=	\$18.34	\$36.67	x	0.30	=	\$11.00
1999	\$38.87	x	0.75	=	\$29.15	\$38.87	x	0.60	=	\$23.32	\$38.87	x	0.50	=	\$19.44	\$38.87	x	0.30	=	\$11.66
2000	\$39.46	x	0.75	=	\$29.60	\$39.46	x	0.60	=	\$23.68	\$39.46	x	0.50	=	\$19.73	\$39.46	x	0.30	=	\$11.84
2001	\$36.98	x	0.75	=	\$27.74	\$36.98	x	0.60	=	\$22.19	\$36.98	x	0.50	=	\$18.49	\$36.98	x	0.30	=	\$11.09
2002	\$38.38	x	0.75	=	\$28.78	\$38.38	x	0.60	=	\$23.03	\$38.38	x	0.50	=	\$19.19	\$38.38	x	0.30	=	\$11.51
HARDWOOD																				
Soil Productivity Class	I			II			III			IV										
	Year	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost	Cost	Factor	Prorated Cost							
1998	\$36.67	x	0.45	=	\$16.50	\$36.67	x	0.40	=	\$14.67	\$36.67	x	0.30	=	\$11.00	\$36.67	x	0.20	=	\$7.33
1999	\$38.87	x	0.45	=	\$17.49	\$38.87	x	0.40	=	\$15.55	\$38.87	x	0.30	=	\$11.66	\$38.87	x	0.20	=	\$7.77
2000	\$39.46	x	0.45	=	\$17.76	\$39.46	x	0.40	=	\$15.78	\$39.46	x	0.30	=	\$11.84	\$39.46	x	0.20	=	\$7.89
2001	\$36.98	x	0.45	=	\$16.64	\$36.98	x	0.40	=	\$14.79	\$36.98	x	0.30	=	\$11.09	\$36.98	x	0.20	=	\$7.40
2002	\$38.38	x	0.45	=	\$17.27	\$38.38	x	0.40	=	\$15.35	\$38.38	x	0.30	=	\$11.51	\$38.38	x	0.20	=	\$7.68

Factors based on Texas Forest Service Timberland Management Cost Study

**TABLE 14. Calculation of Average Annual Net Income**

PINE												
Soil Productivity Class	I			II			III			IV		
	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income
1998	\$98.41	- 44.00	= \$54.41	\$73.99	- 36.67	= \$37.32	\$51.05	- 29.34	= \$21.71	\$36.26	- 12.83	= \$23.43
1999	\$87.71	- 46.64	= \$41.07	\$65.95	- 38.87	= \$27.08	\$45.51	- 31.10	= \$14.41	\$32.32	- 13.60	= \$18.72
2000	\$78.35	- 47.35	= \$31.00	\$58.91	- 39.46	= \$19.45	\$40.65	- 31.57	= \$9.08	\$28.87	- 13.81	= \$15.06
2001	\$72.70	- 44.38	= \$28.32	\$54.66	- 36.98	= \$17.68	\$37.72	- 29.58	= \$8.14	\$26.78	- 12.94	= \$13.84
2002	\$73.44	- 46.05	= \$27.39	\$55.22	- 38.38	= \$16.84	\$38.10	- 30.70	= \$7.40	\$27.06	- 13.43	= \$13.63
<b>5 Year Average</b>			<b>\$36.44</b>			<b>\$23.67</b>			<b>\$12.15</b>			<b>\$16.94</b>
MIXED												
Soil Productivity Class	I			II			III			IV		
	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income
1998	\$65.10	- 27.50	= \$37.60	\$48.95	- 22.00	= \$26.95	\$33.78	- 18.34	= \$15.44	\$23.99	- 11.00	= \$12.99
1999	\$59.29	- 29.15	= \$30.14	\$44.58	- 23.32	= \$21.26	\$30.76	- 19.44	= \$11.32	\$21.84	- 11.66	= \$10.18
2000	\$53.98	- 29.60	= \$24.38	\$40.59	- 23.68	= \$16.91	\$28.01	- 19.73	= \$8.28	\$19.89	- 11.84	= \$8.05
2001	\$51.38	- 27.74	= \$23.64	\$38.63	- 22.19	= \$16.44	\$26.65	- 18.49	= \$8.16	\$18.93	- 11.09	= \$7.84
2002	\$52.02	- 28.78	= \$23.24	\$39.11	- 23.03	= \$16.08	\$26.99	- 19.19	= \$7.80	\$19.16	- 11.51	= \$7.65
<b>5 Year Average</b>			<b>\$27.80</b>			<b>\$19.53</b>			<b>\$10.20</b>			<b>\$9.34</b>
HARDWOOD												
Soil Productivity Class	I			II			III			IV		
	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income	Potential Gross Income	Annual Costs	Net Income
1998	\$31.77	- 16.50	= \$15.27	\$23.89	- 14.67	= \$9.22	\$16.48	- 11.00	= \$5.48	\$11.71	- 7.33	= \$4.38
1999	\$29.79	- 17.49	= \$12.30	\$22.40	- 15.55	= \$6.85	\$15.46	- 11.66	= \$3.80	\$10.98	- 7.77	= \$3.21
2000	\$27.36	- 17.76	= \$9.60	\$20.57	- 15.78	= \$4.79	\$14.19	- 11.84	= \$2.35	\$10.08	- 7.89	= \$2.19
2001	\$26.85	- 16.64	= \$10.21	\$20.19	- 14.79	= \$5.40	\$13.93	- 11.09	= \$2.84	\$9.89	- 7.40	= \$2.49
2002	\$26.57	- 17.27	= \$9.30	\$19.98	- 15.35	= \$4.63	\$13.79	- 11.51	= \$2.28	\$9.79	- 7.68	= \$2.11
<b>5 Year Average</b>			<b>\$11.34</b>			<b>\$6.18</b>			<b>\$3.35</b>			<b>\$2.88</b>

**TABLE 15.**  
**Calculation of Timber Productivity Values**

CAPITALIZATION RATE                      6.40%                      2003 value

Soil Productivity Classes								
Soil Productivity Class	I		II		III		IV	
Forest Type	Net Income	Productivity Value	Net Income	Productivity Value	Net Income	Productivity Value	Net Income	Productivity Value
Pine	\$36.44	\$569.38	\$23.67	\$369.84	\$12.15	\$189.84	\$16.94	\$264.69
Mixed	\$27.80	\$434.38	\$19.53	\$305.16	\$10.20	\$159.38	\$9.34	\$145.94
Hardwood	\$11.34	\$177.19	\$6.18	\$96.56	\$3.35	\$52.34	\$2.88	\$45.00

## APPENDIX C.

# Timber Management Cost Model for Texas Timberland

Cost Item	Frequency
Property taxes	Annually
Consultant fees	At time of harvest (average of three times during a 35-year rotation)*
Consultant fees for management/administration	Annually
Accountants fees	Annually
Reforestation expenses (site preparation, seedlings, planting, etc.)	Once every 20 to 35 years
Boundary line maintenance	Once ever 5 to 10 years (average is 7 years)
Fire break/lane establishment	Once every 20 to 35 years
Fire break/lane maintenance	Once every 1 to 3 years (average is 3 years)*
Road maintenance	Once every 3 to 5 years (average is 4 years)*
Timber stand improvement <ul style="list-style-type: none"> <li>• herbicide application</li> <li>• prescribed burning</li> <li>• pre-commercial thinning</li> <li>• fertilization</li> <li>• pruning</li> </ul>	Once every 3 to 5 years (average is 3 years)* Once every 3 to 5 years (average is 3 years)* Once every 20 to 35 years (once during rotation possible) Every 10 to 35 years Every 12 to 35 years
Surveying	Once during ownership if boundaries are maintained
Legal fees	Once every 5 to 10 years
Pest control	Once every 3 to 10 years (average is 7 years)*
Pest Inspection	Annually
Insurance	Annually
Travel to forest (reasonable travel)	Once or more annually

\*Recognizing the wide range of ownership objectives and intensity of management, for any specific management activity, a range of years is provided. But the average time period presented is the recommended reasonable length of time for the prudent manager.

**Note:** If a chief appraiser is using information received from a contractor maintaining or harvesting timber for the landowner, depreciation on capitalized equipment cannot be considered a timber-management cost factor. However, if the landowner is maintaining or harvesting the timber, depreciation on capitalized equipment is a timber-management cost factor that should be included by the chief appraiser.





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