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Economic Impacts of Current-Use Assessment of Rural Land in the East Texas Pineywoods Region

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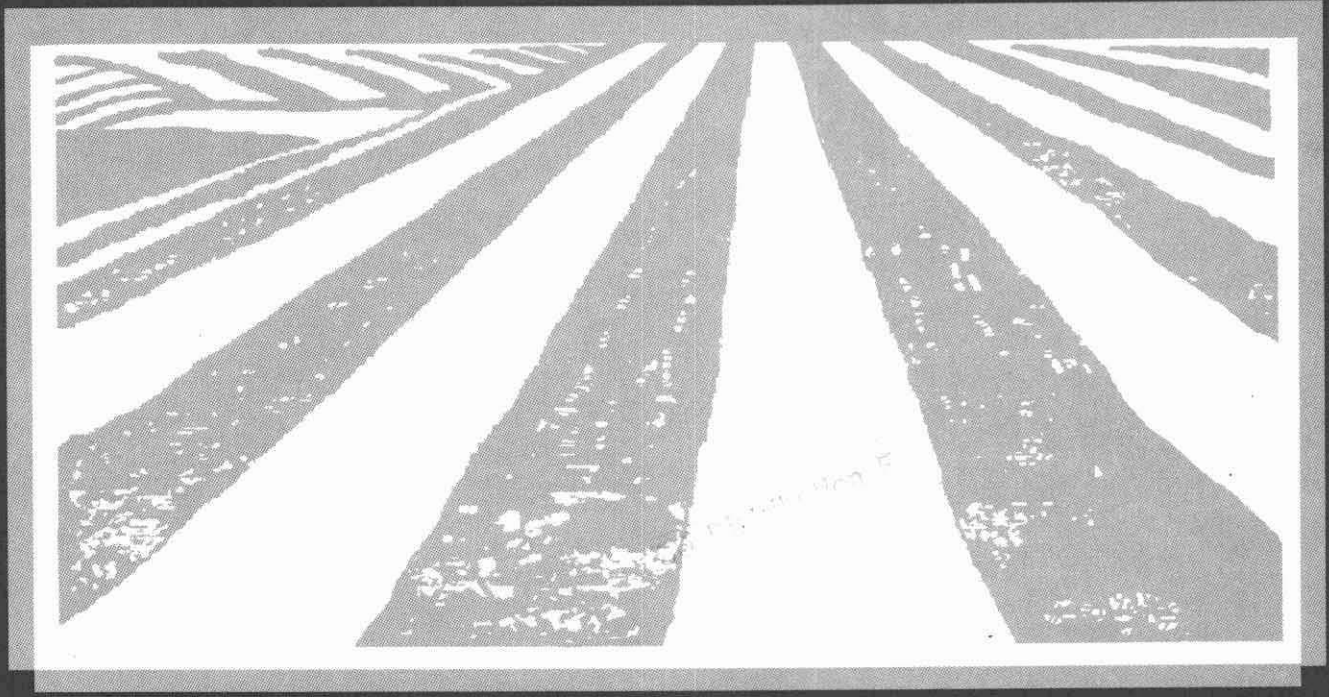

SUMMARY

Texas established a program of current-use property tax assessment in 1966 when voters approved a constitutional amendment providing that selected agricultural land could be taxed on this basis. In 1978 the program was expanded to include certain timberland. These current-use initiatives were studied in the east Texas pineywoods region to: (1) estimate the extent of adoption by qualifying property owners, (2) estimate the effects on assessments and taxes of enrolled land, (3) estimate the impacts on revenues received by local governments, (4) estimate the effects on taxes borne by ineligible and nonparticipating property owners, and (5) evaluate the impacts on rural land use decisions. The study results, all pertaining to 1987, indicate that 86 percent of eligible land was enrolled. Nontimberland enrollments exceeded timberland enrollments, particularly in northeast Texas. On an average, timberland taxes dropped $10.03 per acre, and nontimberland taxes dropped $16.26 per acre. The average use value tax for timberland exceeded that for nontimberland—$2.74 as opposed to $1.44 per acre. Tax revenue and tax-shifting effects were both substantial when viewed alone but were not large compared to those arising from various tax exemptions authorized under Texas law. Of the revenue and tax-shifting effects directly attributable to current-use valuation, most stemmed from its extension to nontimberland. Findings pertaining to the impacts of current-use valuation on rural land use decisions were inconclusive. On the positive side, program withdrawals were not concentrated in appraisal districts where the threat of development was greatest. On the negative side, participation levels were somewhat less in more urbanized appraisal districts.

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INTRODUCTION

Background

The property tax laws of most States now provide for the assessment of agricultural and forest land on the basis of current use (Dunford and others 1986, Hickman 1983). Under this procedure, all values reflecting development potential for other uses, no matter how apparent, are ignored. Agricultural land is taxed solely on its value for continued agricultural use and forest land solely on its value for continued forest use. Sometimes this method of valuation is mandated, but more often qualifying property owners must elect current-use over the normal assessment standard of fair market valuation. Fair market value is the price to which a willing buyer and willing seller would agree when both are equally knowledgeable of the market situation and under no compulsion to buy or sell.

The proliferation of use value laws has resulted essentially from two legislative desires: (1) to improve tax equity and (2) to encourage the retention of certain undeveloped land in its traditional uses (Atkinson 1977, Dunford and O'Neill 1981, Gloudemans 1974). Regarding the tax equity goal, a considerable amount of evidence indicates that the traditional property tax often imposes a disproportionately heavy burden on farm, forest, and other rural property owners (Gloudemans 1974). Such individuals tend to have more of their assets concentrated in forms that cannot easily escape detection (e.g., land and buildings), and their incomes have tended to lag behind those of urban residents. Use valuation addresses this inequity by providing tax relief to rural taxpayers. Regarding the land use goal, experience has shown that, in areas subject to pressures from urbanization, industrialization, or recreational development, the market values of farm, forest, and other rural land often exceed their values based on current income-producing capability. When these higher values are reflected in market-based assessments, tax burdens on rural taxpayers can increase even though their present income does not. The result is that some rural land is sold and/or developed even though the original owners do not wish to take these actions. If conversions are sufficiently widespread, future food and fiber production capabilities can be jeopardized together with the ability to meet the public's demand for open space. Use valuation addresses this possible problem by restoring the relationship between the taxable value of rural land and its potential for producing income from its current uses.

Use Valuation in Texas

Texas first adopted use valuation in 1966 when voters approved a constitutional amendment (Article VIII, Section 1-d) providing that certain agricultural land could be assessed on that basis. The amendment was self-enabling and thus did not require passage of implementing legislation; however, the current-use program that is authorized was quite restrictive and has never been widely utilized. In 1978 voters approved another constitutional amendment (Article VIII, Section 1-d-1) that greatly enlarged the potential for applying use assessment. This second amendment, unlike its predecessor, required the legislature to draft and pass legislation detailing how use valuation was to be implemented. This occurred with the passage of House bill (HB) 1060, which became effective on May 31, 1979.

The differences between Texas' two current-use assessment programs are summarized in table 1. The key distinctions are that the second constitutional amendment and subsequent House bill:

1. Extended eligibility from just agricultural land to agricultural, timber, and so-called "ecological laboratory" land.

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Table 1.—*Key provisions of Texas' two current-use assessment programs (January 1, 1989)**

Aspect of program	Current-use assessment program	
	Article VIII, Section 1-d	Article VIII, Section 1-d-1
Land types qualifying	Agricultural—i.e., land devoted principally to raising livestock or growing crops, fruits, vegetables, flowers, or other products of the soil.	Agricultural—i.e., land devoted principally to raising livestock or growing crops, fruits, vegetables, flowers, or other products of the soil; also land left idle because of a governmental program or crop or livestock rotation procedures. Timber—i.e., land devoted principally to the production of timber or forest products. Ecological laboratory—i.e., land devoted principally to teaching and/or research by public or private colleges and universities.
Eligibility restrictions	Eligibility is restricted in essentially the following ways: 1. The land must be owned by a "natural person"—i.e., corporations and partnerships do not qualify. 2. The land must have been in an agricultural use for the 3 preceding years. 3. The land must be managed as a business—i.e., for profit; furthermore, this business must be the primary occupation and source of income of the landowner.	The eligibility of all three qualifying land types is restricted in the following ways: 1. The land must not be located within the corporate limits of an incorporated city or town unless: (i) the city or town government is not providing the area with services that are substantially equivalent to those provided to other similar areas within its boundaries, or (ii) the area has been continuously devoted to a qualifying use for the preceding 5 years. 2. The land must not be owned by a nonresident alien or foreign government; or by a corporation, partnership, trust, or other legal entity in which a nonresident alien or foreign government owns a majority interest. Additional restrictions common to both agricultural land and timberland include: 1. The land must be managed to a level of intensity consistent with accepted practice in the area. 2. The land must have been in agricultural or timber use for 5 of the last 7 years. In the case of timberlands, the land must be used with the intent to produce income.
Application requirements	Annual applications must be submitted. Application is to be made on a form prescribed by the State Property Tax Board.	Initial application must be submitted. New application required only if ownership or the land's eligibility status changes. Application is to be made on a form prescribed by the State Property Tax Board.
Valuation procedures	Chief appraiser is to consider only those factors that determine agricultural use value. Minerals and rights to subsurface minerals are to be valued separately. The current-use value cannot exceed the fair market value.	For all three qualifying land types, the income capitalization method of value determination is to be utilized. The average net incomes obtainable from different land uses and grades of land are to be estimated by considering: (i) representative owner-operator budgets—i.e., income and cost patterns and (ii) representative lease payments—i.e., rentals. Minerals and rights to subsurface minerals are to be valued separately. The current-use value cannot exceed the fair market value. Also, in the case of timberland, the current-use value cannot be less than the appraised value that was established in 1978.

Table 1.—*Key provisions of Texas' two current-use assessment programs (January 1, 1989)*—Continued*

Aspect of program	Current-use assessment program	
	Article VIII, Section 1-d	Article VIII, Section 1-d-1
Declassification procedures	A penalty is imposed whenever enrolled land is either: (i) converted to an ineligible use or (ii) sold. The penalty consists of a 3-year rollback tax—i.e., a tax equaling the difference between the taxes actually paid and those that would have been paid in the absence of use valuation. Interest charges, computed at a rate of 12 percent, are added to the back taxes.	A penalty is imposed whenever enrolled land is converted to an ineligible use for reasons other than right-of-way acquisition or condemnation. The penalty consists of a 5-year rollback tax—i.e., a tax equaling the difference between the taxes actually paid and those that would have been paid in the absence of use valuation. Interest charges, computed at a rate of 7 percent, are added to the back taxes.
Other features	None.	Enrollees must notify the local appraisal office, in writing, if (i) there is a change in land use that terminates program eligibility or (ii) there is a change from one qualifying use to another. Failure to give proper notification will result in the imposition of a penalty equaling 10 percent of the difference between the taxes actually imposed and those that would otherwise have been imposed.

* Compiled from Texas Property Tax Code, Sections 23.41 to 23.46 and 23.51 to 23.57.

2. Precluded enrolled of land owned by corporations, partnerships, and other legal entities that are not natural persons only when a nonresident alien or foreign government owns a majority interest in the entity.
3. Mandated use of the income capitalization approach as opposed to merely stipulating that appraisers were to ignore all factors except those that determine agricultural use value.
4. Imposed a rollback tax penalty only when enrolled land is placed on a nonqualifying use, not when it is sold.

Controversial Aspects of Current-Use Assessment

Despite their widespread popularity, current-use assessment laws, particularly in recent years, have become the object of considerable controversy. Criticisms have centered on three issues. First, questions have been raised concerning the potential impact of use valuation on the ability of local governments to raise needed operating revenues (Keene and others 1976). This issue arises because millage rate adjustments are often constrained by political pressures or by statute. In these situations, both tax revenues and the public services they support can decline as use assessment reduces the value of the tax base. Second, the potential tax-shifting (i.e., redistributional) impacts of use valuation have been questioned (Coughlin and others 1981, Dunford 1980, Keene and others 1976). This issue arises because local governments, when free to do so, typically respond to the implementation of current-use assessment by increasing millage rates. This response enables revenues to be stabilized or increased. At the same time, however, it also adds to the tax burden of ineligible and nonparticipating property owners for whom the higher millage rates are applied to undiminished assessments. Finally, questions have been raised concerning the ability of current-use programs to ensure that undeveloped rural land is retained in its traditional uses (Atkinson 1977, Coughlin and others 1978, Keene and others 1976). Critics contend that, by itself, use valuation tends to be ineffective because: (1) the tax savings provided are generally small compared to the major cost of withholding land from development—i.e., forgone interest;[1] (2) it addresses only one of a broad range of economic, demographic, and sociological factors that can affect the decision to sell or develop a property; and (3) the subsidy that it represents is usually capitalized into higher land values and thus is irrelevant to all but the initial property owners.[2]

Spraberry (1985), recognizing the preceding concerns, studied the effects resulting from the application of Texas' current-use assessment programs to agricultural land. In Texas, however, it is the current-

[1] This argument rests upon the opportunity cost concept. By keeping capital tied up in the form of undeveloped land, owners implicitly forgo the interest they could earn by selling the land to developers and investing the proceeds elsewhere.

[2] This argument recognizes that when land eligible for use assessment is sold, the present value of all anticipated future tax savings will normally be reflected in the sales price. This being the case, the tax preference will be irrelevant to the new owner's land use decisions.

use valuation of timberland that has been especially controversial. Evidence of this controversy is the fact that the State constitution mandates that qualifying agricultural land be assessed on the basis of the use but the extension of such treatment to woodland is at the discretion of the legislature (Texas Constitution, Art. VIII, Sec. 1-d-1).

Study Scope and Objectives

This investigation focuses on the fiscal and land use impacts attributable to the use assessment of timberland. Consistent with this emphasis, only the State's 43 easternmost appraisal districts, or counties (fig. 1),[3] were considered. This area contains essentially all of the State's commercial forest land—i.e., land capable of growing repeated crops of industrial wood and which has not been withdrawn from timber utilization (Lang and Bertelson 1987).

The study had five specific objectives. The first four entailed developing statistics for each appraisal district, for the subregions (i.e., northeast and southeast Texas as defined in figure 1), and for the east Texas area as a whole. These objectives were:

1. To estimate the extent to which use valuation had been elected by qualifying forest owners and to compare these enrollment levels with those for qualifying nonforest land.
2. To estimate the effects of use valuation on the average per acre assessments and taxes of participating timberland and to compare these effects with those for participating nontimberland.
3. To estimate the potential tax revenue effects of assessing timberland on the basis of current-use and to compare these effects with those attributable to the use valuation of nontimberland as well as to all operative tax exemptions.[4]
4. To estimate the potential tax-shifting (i.e., redistributional) effects of assessing timberland on the basis of current-use and to compare these effects with those attributable to use valuation of nontimberland as well as to all operative tax exemptions.

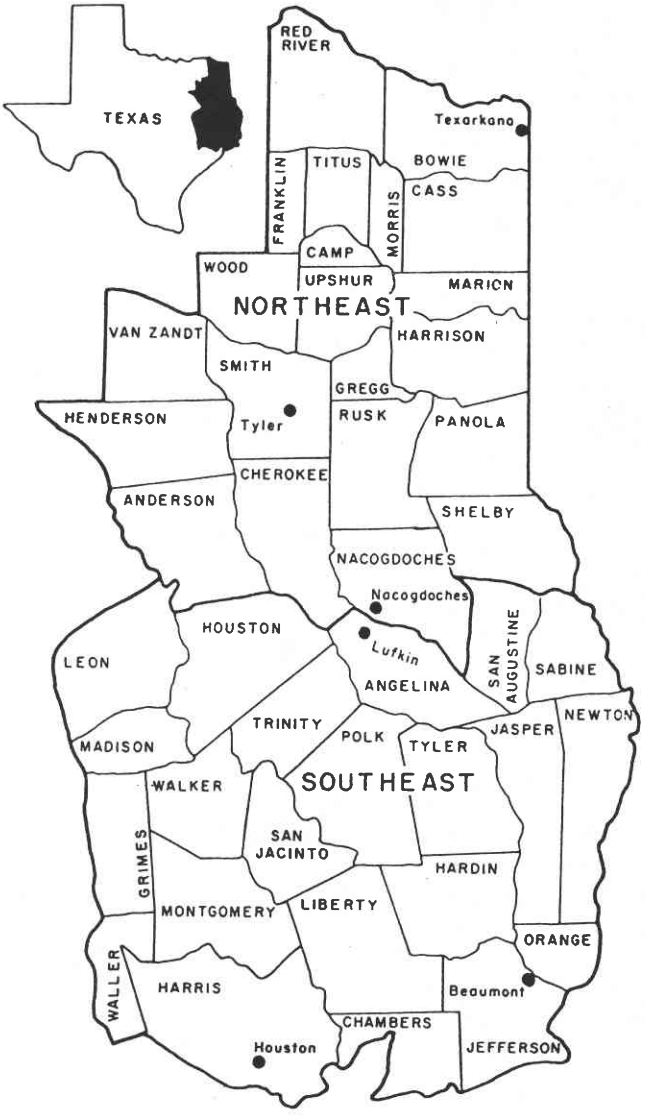

Figure 1.—*Map of study area showing location of appraisal districts (i.e., counties) with commercial forest land.*

The last objective entailed developing statistics only by subregion and for the entire east Texas area. It was:

5. To evaluate the effectiveness of current-use assessment as a tool for perpetuating existing rural land uses.

For the first four objectives, appraisal districts were the basic units of analysis even though the districts are not themselves taxing entities. Typically, in similar investigations (Flick and others 1989, Gayer and others 1987), counties have fulfilled this role. Because of the close correspondence between appraisal districts and counties, this substitution was deemed of little substantive importance. The distinction, however, should be kept in mind when interpreting the study results, particularly with respect to objective 3.

[3] In Texas, all taxing entities—e.g., counties, municipalities, and school districts—utilize assessments developed by the appraisal districts within which they are situated. With only minor exceptions, appraisal district and county boundaries coincide.

[4] Texas law authorizes a variety of partial and total exemptions for different types of taxable property as well as classes of property owners. Examples include homestead exemptions, exemptions for persons over 65, and exemptions for disabled veterans.

STUDY METHODS

Data Collection

All 43 appraisal districts, or counties, within the study area provided data for the year 1987, thereby eliminating the need for sampling. In every instance, the required information was obtained from records available through the State Property Tax Board in Austin. The specific data sources were: (1) the property value reports submitted annually by each appraisal district, (2) a computer printout showing the total tax rates and total tax levies of all taxing jurisdictions—i.e., counties, municipalities, school districts, and special taxing units,[5] and (3) a computer printout showing the rollback taxes collected by all taxing authorities. The nature of the data obtained from the latter two sources is fairly evident, but the information gathered from the first source requires additional explanation. For each appraisal district this information consisted of the following:

1. The total gross appraised value of all taxable property, which indicates the size of the assessment base prior to allowances for current-use valuation and all operative exemptions.
2. The total net appraised value of all taxable property in each taxing jurisdiction, which indicates the size of the assessment base after allowances for current-use valuation and all operative exemptions.
3. The total acreage of category D land, which includes farm and ranch, timber, recreational, idle, and waste land when these occur in tracts over 5 acres in size.
4. The total acreage, total market value, and total use value of all land that was qualified for current-use assessment under Article VIII, Section 1-d.
5. The total acreage, total market value, and total use value of all land that was qualified for current-use assessment under Article VIII, Section 1-d-1.
6. The total acreage, typical market value per acre, and typical use value per acre of all timberland that was qualified for current-use assessment.[6]

Data Analysis

The procedures used to analyze the data will be described by objective. Recognize, however, that all land eligible for current-use valuation was lumped into two broad classes: timber and nontimber. Nontimberland included farm and ranch, horticultural, and the so-called ecological laboratory land.

Objective 1: To Estimate Adoption—The extent of adoption of current-use assessment within each appraisal district was measured essentially in three ways, reflecting total, timberland, and nontimberland enrollments.

The total acreage of land assessed at current-use was determined by aggregating the total acreages enrolled under both of the State's use value programs. This figure was then expressed as a percentage of the total amount of category D land, thereby providing an indicator of the proportion of all eligible land being assessed on the basis of use. Implicitly, this procedure assumes that the acreage of category D land is a reasonable proxy for the total area of land that could conceivably qualify for use assessment.

The timberland acreage under use valuation was ascertained directly during sampling. To get an indication of the relative importance of such land in the total use assessment picture, the amount of timberland enrolled was expressed as a percentage of the total land area enrolled.

Finally, the acreage of nontimberland subject to use valuation was computed as the difference between the total acreage assessed on that basis and the amount of woodland so assessed. As was done in the case of timberland, the acreage of participating nontimberland was expressed as a percentage of the total acreage enrolled, thereby providing an indicator of this land type's relative importance in the total picture of current-use valuation.

Adoption of use valuation at the subregional (i.e., northeast and southeast Texas) and regional (i.e., east Texas as a whole) levels was determined, in acreage terms, by aggregating the enrollment figures for the relevant appraisal districts. The percentage-based participation measurements were computed in the same manner as for the individual appraisal districts.

Objective 2: To Estimate Effects on Participants.—The effect of use valuation on the average per acre assessment of participating timberland in each appraisal district was determined by deducting the typical use value per acre of such land from the typical market value per acre.[7] The policy's effect on the average per acre assessment of participating nontimberland was computed as follows:

$$\Delta\, vN = \frac{[(MA_1 + MA_2) - (mT)(T)] - [(UA_1 + UA_2) - (uT)(T)]}{(A_1 + A_2) - T}$$

[5] Special taxing units are of many types. Among those encountered in this study were water, hospital, utility, rural fire, and conservation districts.

[6] Typical value was not explicitly defined on the property value reports but was assumed to be synonymous with average value.

[7] Texas does not utilize fractional assessments. Appraised value equals assessed value, thereby implying an assessment ratio of 1.0.

where:

ΔvN = change in average per acre assessment of participating nontimberland,
MA_1 = market value of total acreage enrolled under Art. VIII, Sec. 1-d,
MA_2 = market value of total acreage enrolled under Art. VIII, Sec. 1-d-1,
mT = typical market value per acre of participating timberland,
T = acreage of timberland enrolled,
UA_1 = use value of total acreage enrolled under Art. VIII, Sec. 1-d,
UA_2 = use value of total acreage enrolled under Art. VIII, Sec. 1-d-1,
uT = typical use value per acre of participating timberland
A_1 = total acreage enrolled under Art. VIII, Sec. 1-d, and
A_2 = total acreage enrolled under Art. VIII, Sec. 1-d-1.

Before the effect of current-use valuation on the average per acre tax for each class of participating land could be estimated, it was necessary to calculate a composite tax rate representative of the total rate that would have been applicable to a typical property in each of the appraisal districts. These composite rates (shown in table 2) were developed through a weighted-averaging process consisting of the following steps.

1. The relevant county tax rate was extracted from the data collected during sampling.
2. Average municipal, school district, and special tax unit tax rates were determined by dividing the total taxes levied within each class of taxing jurisdictions by the total net appraised value of all taxable property within these same classes.
3. The composite tax rate was computed as a weighted average of the rates generated in the preceding steps. The county, school district, and special tax unit rates were each assigned weights of 1.0. The municipal rate, in recognition of the fact that many rural properties might not fall within the boundaries of a municipal jurisdiction, was assigned a weight equaling the proportion of all appraisal district land that was not of a rural nature—i.e., that was not category D land.

Table 2.—*Calculated composite tax rates used to analyze fiscal impacts of Texas' current-use assessment program*

Appraisal district	Calculated composite tax rate	Appraisal district	Calculated composite tax rate
	*Mills**		*Mills**
Northeast Texas		Southeast Texas	
Anderson	15.500	Angelina	13.015
Bowie	18.674	Chambers	13.965
Camp	8.988	Grimes	39.217
Cass	10.388	Hardin	17.389
Cherokee	13.258	Harris	15.359
Franklin	14.736	Houston	10.465
Gregg	13.351	Jasper	12.158
Harrison	11.699	Jefferson	18.064
Henderson	13.087	Leon	7.408
Marion	14.643	Liberty	14.863
Morris	6.375	Madison	15.946
Nacogdoches	15.269	Montgomery	19.766
Panola	12.187	Newton	16.303
Red River	15.219	Orange	16.860
Rusk	13.296	Polk	14.966
Shelby	14.363	Sabine	8.776
Smith	11.117	San Augustine	13.003
Titus	9.919	San Jacinto	15.791
Upshur	14.728	Trinity	13.747
Van Zandt	12.815	Tyler	16.804
Wood	12.406	Walker	18.543
		Waller	18.210

* Mills indicate dollars of tax per thousand dollars of assessed valuation.

The composite rate for each appraisal district was intended to reflect the tax rate that would have been required, given current-use and all operative exemptions, to produce the total revenue that was actually collected by all taxing authorities in 1987.

With the composite rates in hand, the effects of use valuation on the average per acre taxes borne by participating timberland owners in each appraisal district were computed as follows:

$$\Delta tT = (cr)(mT) - (cr)(uT)$$

where:

ΔtT = change in average per acre tax on participating timberland,
cr = composite tax rate, and
all other variables are as previously defined.

The impacts on nontimberland taxes were calculated as:

$$\Delta tN = \frac{cr[(MA_1 + MA_2) - (mT)(T)] - cr[(UA_1 + UA_2) - (uT)(T)]}{(A_1 + A_2) - T}$$

$$= cr(\Delta vN)$$

where:

ΔtN = change in average per acre tax on participating nontimberland, and
all other variables are as previously defined.

The subregional and regional effects of current-use on the average per acre assessments and taxes of both qualifying land types were computed as weighted means of the figures for the individual appraisal districts. The weights used in the averaging process were the acreages of enrolled timberland and nontimberland in each of the appraisal districts.

Objective 3: To Estimate Effects on Revenues.—The effect of use valuation on the total revenue raised within each appraisal district and the importance of current-use assessment relative to all operative exemptions in determining the amount of tax collected were evaluated under the assumption that tax rates would be fixed at the level of the composite rates shown in table 2. The analysis should thus be viewed as showing potential revenue losses because the losses are based upon a comparison of the total revenue that would be generated with and without current-use assessment and all operative exemptions. However, no allowance is made for the fact that local governments can normally increase tax rates, at least within limits, when tax concessions are granted to selected groups of taxpayers.

For each appraisal district, the total revenue that would have been raised in the absence of both current-use and all operative exemptions was determined by multiplying the total gross appraised value of all taxable property by the composite rate. The revenue actually raised, with these tax concessions in place, was then calculated by multiplying the total net appraised value of this same property by the same composite rate. The difference between the two figures, by definition, represents the total revenue loss attributable to the combined effect of use valuation and all operative exemptions. To better indicate the possible significance of these losses, they were expressed as percentages of the potential revenues that could have been collected without the concessions.

The relative importance of the various revenue-loss contributors was evaluated by partitioning the total losses into three parts: (1) that due to use assessment of enrolled timberland, (2) that due to use assessment of enrolled nontimberland, and (3) that due to all operative tax exemptions. The proportion due to participating timberland was computed as follows:

$$PRL_T = \left[\frac{(cr)(mT)(T) - (cr)(uT)(T)}{cr(GAV - NAV)}\right] \quad (100)$$

where:

PRL_T = proportion of total revenue loss due to use valuation of enrolled timberland,
GAV = total gross appraised value of all taxable property in appraisal district,
NAV = total net appraised value of all taxable property in appraisal district, and
all other variables are as previously defined.

The proportion due to participating nontimberland was calculated as:

$$\mathrm{PRL_N} = \left\{\frac{cr[(MA_1 + MA_2) - (mT)(T)] - cr[(UA_1 + UA_2) - (uT)(T)]}{\mathrm{cr(GAV - NAV)}}\right\} \quad (100)$$

where:

PRL_N = proportion of total revenue loss due to use valuation of enrolled nontimberland, and
all other variables are as previously defined.

Finally, the proportion due to all operative exemptions was determined by means of the following relationship:

$$PRL_E = 100 - (PRL_T + PRL_N)$$

where:

PRL_E = proportion of total revenue loss due to all operative exemptions, and
all other variables are as previously defined.

The revenue losses at the subregional and regional levels, in dollar terms, were estimated by aggregating the losses for the appropriate appraisal districts. The aggregate losses were then expressed as percentages

of the aggregate potential revenue collections. The partitioning of the total losses among the three tax concessions that gave rise to them was accomplished using procedures analogous to those employed for the individual appraisal districts. These percentages are not, therefore, simple arithmetical averages of the relevant appraisal district values.

Objective 4: To Estimate Tax-Shifting Effects.—The redistributional effects of use valuation and the importance of current-use assessment relative to all operative exemptions in determining the extent of tax shifting were analyzed under the assumption that local governments would adjust tax rates to stabilize revenues at the amounts actually collected in 1987. The following computational process entailing four steps was applied within each appraisal district: (1) estimation of the total tax imposed on ineligible and nonparticipating property without use valuation and all operative exemptions, (2) estimation of the total tax imposed on these same classes of property with both tax concessions in place, (3) determination of the total tax shift, and (4) partitioning of the total shift among all relevant causal factors. It should be emphasized that this procedure indicates how taxes are redistributed among different categories of taxable property. It does not explicitly show how taxes are shifted among different groups of taxpayers. Intuitively, however, a strong relationship would be expected between classes of taxable property and classes of taxpayers.

For step 1, it was first necessary to determine the tax rates that would have been required, in the absence of both tax concessions, to generate the revenues actually collected in 1987. These rates (shown in table 3) were computed as follows:

$$er = \frac{cr(NAV)}{GAV}$$

where:

er = tax rate required, in the absence of current-use assessment and all operative exemptions, to generate revenues equivalent to those raised in 1987, and
all other variables are as previously defined.

The desired tax burdens were then calculated as:

$$BI_{wo} = er[NAV - (UA_1 + UA_2)]$$

where:

BI_{wo} = tax imposed on ineligible and nonparticipating property without current-use assess-

Table 3.—*Tax rates required to stabilize revenues, in the absence of all tax concessions, at levels collected in 1987*

Appraisal district	Estimated equivalent tax rate	Appraisal district	Estimated equivalent tax rate
	*Mills**		*Mills**
Northeast Texas		Southeast Texas	
Anderson	10.439	Angelina	10.304
Bowie	15.460	Chambers	12.433
Camp	7.147	Grimes	19.623
Cass	6.386	Hardin	11.118
Cherokee	8.465	Harris	12.997
Franklin	10.387	Houston	5.595
Gregg	11.103	Jasper	7.713
Harrison	9.967	Jefferson	16.353
Henderson	9.615	Leon	4.465
Marion	11.324	Liberty	10.764
Morris	5.514	Madison	6.780
Nacogdoches	10.314	Montgomery	16.976
Panola	10.010	Newton	7.752
Red River	6.478	Orange	14.499
Rusk	10.340	Polk	9.892
Shelby	7.542	Sabine	5.394
Smith	9.614	San Augustine	6.963
Titus	8.312	San Jacinto	10.130
Upshur	8.855	Trinity	7.393
Van Zandt	7.969	Tyler	7.279
Wood	9.814	Walker	14.411
		Waller	2.952

* Mills indicate dollars of tax per thousand dollars of assessed valuation.

ment and all operative exemptions, and all other variables are as previously defined.

In step two, the tax burdens imposed on ineligible and nonparticipating property, assuming both tax concessions to be in place, were determined by means of the following relationship:

$$BI_w = cr[NAV - (UA_1 + UA_2)]$$

where:

BI_w = tax imposed on ineligible and nonparticipating property with current-use assessment and all operative exemptions, and all other variables are as previously defined

In step three, the total tax shift for each appraisal district was estimated as the difference between the two tax burden measures developed in the preceding steps—i.e., $BI_w - BI_{wo}$. In each case, to provide a better basis for judging the significance of the shift, it was expressed as a percentage of the total tax levy.

Finally, in step four, the estimated total tax shift for each appraisal district, following the precedent established in the analysis of revenue impacts, was partitioned into three parts: (1) that due to use assessment of enrolled timberland, (2) that due to use assessment of enrolled nontimberland, and (3) that due to all operative tax exemptions. The proportion due to participating timberland was computed as follows:

$$PS_T = \left[\frac{(er)(mT)(T) - (cr)(uT)(T)}{BI_w - BI_w o}\right] \qquad (100)$$

where:

PS_T = proportion of total tax shift due to use valuation of enrolled timberland, and all other variables are as previously defined.

The proportion due to participating nontimberland was calculated as:

$$PS_N = \left\{\frac{er[(MA_1 + MA_2) - (mT)(T)] - cr[(UA_1 + UA_2) - (uT)(T)]}{BI_w - BI_{wo}}\right\} \qquad (100)$$

where:

PS_N = proportion of total tax shift due to use valuation of enrolled nontimberland, and all other variables are as previously defined.

The proportion due to all operative exemptions was determined by means of the following relationship:

$$PS_E = 100 - (PS_T + PS_N)$$

where:

PS_E = proportion of total tax shift due to all operative exemptions, and all other variables are as previously defined

At the subregional and regional levels, the dollar tax shifts were estimated by aggregating the shifts for the appropriate appraisal districts. The aggregate shifts were then expressed as percentages of the aggregate revenues raised. The partitioning of the total shifts among the three concessions that gave rise to them was accomplished using procedures analogous to those employed in the individual appraisal districts. Therefore, these percentages are not simple arithmetical averages of the relevant appraisal district values.

Objective 5: To Evaluate Program Effectiveness.—Most studies of use valuation have not sought to evaluate its effectiveness in encouraging retention of qualifying lands in their historical uses. Investigators addressing the issue have typically relied upon questionnaires by which eligible taxpayers could be directly queried as to whether or not current-use assessment was affecting their land use decisions.

Questionnaire use was not feasible for this study. Accordingly, correlation analysis was used to evaluate the effectiveness of use valuation in discouraging the conversion of rural timberland and nontimberland to more intensive uses. For each subregion, and the east Texas area as a whole, three aspects of program performance were examined. First, the hypothesis that the tax relief provided by use assessment tends to be greater in more urbanized appraisal districts was tested by correlating the average reduction in per acre taxes, for enrolled timberland and nontimberland combined,[8] with both population per square mile and the percentage of population classified as urban.[9] Such a relationship would be expected because development pressures are likely to be greater in more urbanized areas. Second, the hypothesis that program participation levels tend to be higher in more urbanized appraisal districts was tested by correlating the proportion of all eligible land enrolled with both population per square mile and the percentage of population classified as urban. While such a relationship would not be sufficient to prove program success, it is certainly a necessary condition if use assessment is to be

[8] In each appraisal district, the average reduction in per acre taxes for all enrolled land was computed as a weighted average of the typical reductions for participating timberland and nontimberland. The weights used were the acreages of each type of land enrolled.

[9] Data as to the population per square mile and the percentage of population classified as urban were obtained from the latest census report for Texas.

a viable means of combating rural land losses. Last, the hypothesis that program withdrawals are unrelated to the degree of urbanization was tested by correlating both of the previously employed urbanization indicators (i.e., population per square mile and the percentage of population classified as urban) with two measures of withdrawal—rollback taxes collected and estimated acreage withdrawn.[10] The absence of a tendency for withdrawals to be concentrated in the more urbanized appraisal districts would suggest that use assessment is having more than a short-term impact on the land use decisions of rural property owners and would be a particularly enlightening finding if participation levels are indeed higher in these areas.

All simple correlation coefficients were calculated, and all significance testing was conducted, using procedures described by Freese (1967). In every instance, scatter diagrams were prepared prior to computing the correlation coefficients. This preparation was done to ensure that the variables under consideration were not obviously related in some nonlinear fashion.

RESULTS

Adoption Levels

The extent to which qualifying property owners have enrolled their land under current-use assessment is shown in table 4. Overall, it appears that the State's use value programs have been widely accepted. Total participation, measured by the percentage of all eligible land actually enrolled, varied from a high of 98.98 percent in the Sabine Appraisal District to a low of 48.16 percent in the Harris Appraisal District. Participation in southeast Texas was slightly higher than in northeast Texas. In the southeast, 8,897,640 acres, or 87.98 percent of all qualifying land, were enrolled. For the northeast, the comparable figures were 7,898,477 acres and 84.34 percent. Across the east Texas area as a whole, it is estimated that 16,796,117 acres, or 86.23 percent of all eligible land, were being assessed on the basis of use in 1987.

Although east Texas is 55 percent forested (McWilliams and Lord 1988), nontimberland enrollments exceeded timberland enrollments for the region as a whole. Specifically, 9,293,624 acres, or 55.33 percent of all enrolled land, were nontimber, whereas just 7,502,493 acres, or 44.67 percent, were in timber use. This situation was due primarily to enrollment patterns in the northeast subregion. In that area, 4,914,868 acres of nontimberland were assessed at current-use as compared to only 2,983,609 acres of timberland. The proportion of total enrollments attributable to each type of land was 62.23 and 37.77 percent, respectively. In the southeast subregion, participation was much more balanced. In that area, 4,518,884 acres, or 50.79 percent of all enrolled land, were in timber while 4,378,756 acres, or 49.21 percent of the participating land, were in another use. Of the 43 appraisal districts studied, timberland enrollments were predominant in only 18.

Effects on Participants

The effects of use valuation on the average per acre assessments and taxes of enrolled land are shown in tables 5 and 6, respectively. These figures are indicative of the tax relief being received by participating property owners.

Timberland assessment decreases varied from a maximum of $5,825 per acre in the Harris Appraisal District to a minimum of $277 per acre in the Red River District. The average reduction in assessments was somewhat higher in southeast Texas than in northeast Texas—$746 as opposed to $528 per acre. This finding undoubtedly reflects the higher degree of urbanization in the southeastern subregion. Across the east Texas area as a whole, current-use valuation caused timberland assessments to decline, on the average, by $659 per acre.

Timberland tax reductions tended to parallel the observed assessment reductions. The largest decrease, $89.47 per acre, occurred in the Harris Appraisal District and the smallest, $3.18 per acre, in the Morris District. The average tax declines, by subregion, were $6.89 per acre for northeast Texas and $12.11 per acre for southeast Texas. For the entire east Texas area, the average decrease in timberland taxes was $10.03 per acre.

As was expected, enrolled nontimberland, as a general rule, had fair market value assessments that exceeded those for participating timberland. Somewhat surprisingly, however, the current-use assessments of nontimberland were often less than those for timberland. This finding suggests that farmers and ranchers are tending to derive greater tax benefits from use valuation than forest owners. Nontimberland assessment decreases ranged from a high of $8,286 per acre in the Harris Appraisal District to a low of $212 per acre in the Panola District. As was the pattern with timberland, nontimberland assessment reductions tended to be greater in the southeast subregion. There the average decline in assessment was $1,091 per acre as compared to $750 per acre in the northeast. Across the east Texas area as a whole, use valuation

[10] The acreage withdrawn was estimated using the rollback tax data collected during sampling. Specifically, for each appraisal district, the total rollback taxes collected was divided by five times the difference between the average market and use values per acre of all enrolled land.

Table 4.—*Levels of enrollment in Texas' current-use assessment program, 1987*

Appraisal district	Total acreage eligible for current-use	Total acreage enrolled in current-use	Percentage of eligible acreage enrolled in current-use	Timber acreage enrolled in current-use	Percentage of enrolled acreage in timber	Nontimber acreage enrolled in current-use	Percentage of enrolled acreage in nontimber
	--------- *Acres* ---------		*Percent*	*Acres*	*Percent*	*Acres*	*Percent*
Northeast Texas							
Anderson	641,275	504,293	76.64	127,344	25.25	376,949	74.75
Bowie	457,459	360,663	78.84	121,510	33.69	239,153	66.31
Camp	127,641	85,348	66.87	19,557	22.91	65,791	77.09
Cass	650,038	582,071	89.54	383,427	65.87	198,644	34.13
Cherokee	684,758	605,761	88.46	321,373	53.05	284,388	46.95
Franklin	176,203	153,482	87.11	22,274	14.51	131,208	85.49
Gregg	205,489	152,652	74.29	83,622	54.78	69,030	45.22
Harrison	524,452	450,199	85.84	261,070	57.99	189,129	42.01
Henderson	570,872	476,625	83.49	16,100	3.38	460,525	96.62
Marion	219,995	123,421	56.10	0	0	123,421	100.00
Morris	148,244	132,157	89.15	41,874	31.68	90,283	68.32
Nacogdoches	588,309	553,040	94.00	295,733	53.47	257,307	46.53
Panola	490,247	426,506	87.00	253,027	59.33	173,479	40.67
Red River	708,020	640,167	90.42	286,151	44.70	354,016	55.30
Rusk	576,006	527,324	91.55	215,450	40.86	311,874	59.14
Shelby	438,635	430,924	98.24	213,779	49.61	217,145	50.39
Smith	539,139	431,454	80.03	92,373	21.41	339,081	78.59
Titus	238,197	208,185	87.40	15,054	7.23	193,131	92.77
Upshur	395,596	291,999	73.81	143,517	49.15	148,482	50.85
Van Zandt	575,823	445,946	77.44	265	.06	445,681	99.94
Wood	409,005	316,260	66.82	70,109	22.17	246,151	77.83
Southeast Texas							
Angelina	410,098	387,858	94.58	275,322	70.99	112,536	29.01
Chambers	402,766	271,618	67.44	11,984	4.41	259,634	95.59
Grimes	524,850	476,965	90.88	48,012	10.07	428,953	89.93
Hardin	562,530	514,591	91.48	410,341	79.74	104,250	20.26
Harris	494,154	237,974	48.16	28,572	12.01	209,402	87.99
Houston	663,131	617,983	93.19	217,262	35.16	400,721	64.84
Jasper	576,795	557,049	96.58	505,484	90.74	51,565	9.26
Jefferson	417,392	325,212	77.92	16,078	4.94	309,134	95.06
Leon	676,367	636,455	94.10	12,883	2.02	623,572	97.98
Liberty	684,631	608,567	88.89	287,939	47.31	320,628	52.69
Madison	339,410	315,100	92.84	0	0	315,100	100.00
Montgomery	432,619	369,498	85.41	270,345	73.17	99,153	26.83
Newton	571,800	556,884	97.39	520,053	93.39	36,831	6.61
Orange	176,511	133,520	75.64	73,937	55.38	59,583	44.62
Polk	612,160	565,355	92.35	461,729	81.67	103,626	18.33
Sabine	191,095	189,149	98.98	160,399	84.80	28,750	15.20
San Augustine	261,454	255,209	97.61	170,077	66.64	85,132	33.36
San Jacinto	304,185	239,855	78.85	173,468	72.32	66,387	27.68
Trinity	379,400	347,852	91.68	211,761	60.88	136,091	39.12
Tyler	616,331	595,990	96.70	501,912	84.21	94,078	15.79
Walker	390,844	341,142	87.28	147,501	43.24	193,641	56.76
Waller	424,935	353,814	83.26	13,825	3.91	339,989	96.09
Northeast Texas totals	9,365,403	7,898,477	84.34	2,983,609	37.77	4,914,868	62.23
Southeast Texas totals	10,113,458	8,897,640	87.98	4,518,884	50.79	4,378,756	49.21
East Texas totals	19,478,861	16,796,117	86.23	7,502,493	44.67	9,293,624	55.33

Table 5.—*Impacts of Texas' current-use assessment program on taxable value of enrolled land, 1987*

Appraisal district	Timberland			Nontimberland		
	Average fair market value assessment	Average current-use value assessment	Average decrease in assessment	Average fair market value assessment	Average current-use value assessment	Average decrease in assessment
	Dollars per acre					
Northeast Texas						
Anderson	658	191	467	748	67	681
Bowie	520	98	422	693	89	604
Camp	710	285	425	797	125	672
Cass	568	148	420	652	94	558
Cherokee	761	195	566	823	94	729
Franklin	470	50	420	688	102	586
Gregg	1,150	70	1,080	1,569	49	1,520
Harrison	600	95	505	608	75	533
Henderson	970	205	765	948	66	882
Marion	...*	...*	...*	671	106	565
Morris	600	100	500	838	92	746
Nacogdoches	637	180	457	638	71	566
Panola	800	172	628	275	62	212
Red River	335	58	277	723	80	643
Rusk	750	131	619	833	65	767
Shelby	675	180	495	745	93	652
Smith	1,350	263	1,087	1,513	101	1,412
Titus	630	70	560	946	67	879
Upshur	808	173	635	837	104	734
Van Zandt	900	260	640	984	98	886
Wood	665	166	499	712	90	622
Southeast Texas						
Angelina	790	175	615	1,027	156	871
Chambers	848	151	697	726	100	626
Grimes	1,550	150	1,400	1,162	65	1,097
Hardin	810	238	572	634	187	447
Harris	6,045	220	5,825	8,425	139	8,286
Houston	678	180	498	779	49	730
Jasper	800	217	583	1,189	170	1,019
Jefferson	588	205	383	503	148	355
Leon	798	178	620	806	53	753
Liberty	839	194	645	1,015	129	886
Madison	...*	...*	...*	1,185	48	1,137
Montgomery	2,416	170	2,246	2,480	113	2,367
Newton	775	213	562	933	202	730
Orange	770	220	550	1,211	397	814
Polk	856	200	656	970	56	914
Sabine	600	180	420	1,644	238	1,406
San Augustine	830	170	660	389	152	237
San Jacinto	1,030	193	837	1,051	155	896
Trinity	900	345	555	1,114	18	1,096
Tyler	863	228	635	883	109	774
Walker	830	250	580	834	55	779
Waller	2,550	180	2,370	3,363	172	3,191
Northeast Texas wt. means†	676	148	528	833	83	750
Southeast Texas wt. means†	957	211	746	1,257	166	1,091
East Texas wt. means†	845	186	659	1,033	122	911

* No enrolled timberland in the appraisal district.

† Weights used to compute weighted means were acreages of enrolled timberland and nontimberland in each appraisal district.

Table 6.—*Impacts of Texas' current-use assessment program on tax due from enrolled lands, 1987*

Appraisal district	Timberland			Nontimberland		
	Average fair market value tax	Average current-use value tax	Average decrease in tax	Average fair market value tax	Average current-use value tax	Average decrease in tax
	Dollars per acre					
Northeast Texas						
Anderson	10.20	2.96	7.24	11.60	1.04	10.56
Bowie	9.71	1.83	7.88	12.93	1.66	11.27
Camp	6.38	2.56	3.82	7.16	1.13	6.03
Cass	5.90	1.54	4.36	6.77	.98	5.79
Cherokee	10.09	2.59	7.50	11.08	1.24	9.84
Franklin	6.93	.74	6.19	10.14	1.50	8.64
Gregg	15.35	.93	14.42	20.94	.65	20.29
Harrison	7.02	1.61	5.41	7.12	.88	6.24
Henderson	12.70	2.68	10.02	12.41	.87	11.54
Marion	...*	...*	...*	9.83	1.56	8.27
Morris	3.82	.64	3.18	5.43	.58	4.76
Nacogdoches	9.73	2.75	6.98	9.74	1.09	8.65
Panola	9.75	2.10	7.65	3.35	.76	2.59
Red River	5.10	.88	4.22	11.00	1.22	9.78
Rusk	9.97	1.74	8.23	11.07	.87	10.20
Shelby	9.70	2.59	7.11	10.70	1.34	9.36
Smith	15.01	2.92	12.09	16.82	1.12	15.70
Titus	6.25	.69	5.56	9.39	.67	8.72
Upshur	11.90	2.55	9.35	12.33	1.52	10.81
Van Zandt	11.53	3.33	8.20	12.61	1.26	11.35
Wood	8.25	2.06	6.19	8.83	1.12	7.71
Southeast Texas						
Angelina	10.28	2.28	8.00	13.37	2.03	11.34
Chambers	11.84	2.11	9.73	10.14	1.40	8.74
Grimes	60.79	5.88	54.91	45.56	2.54	43.02
Hardin	14.08	4.14	9.94	11.02	3.25	7.77
Harris	92.85	3.38	89.47	129.39	2.13	127.26
Houston	7.10	1.88	5.22	8.16	1.88	6.28
Jasper	9.73	2.64	7.09	14.45	2.07	12.38
Jefferson	10.62	3.70	6.92	9.09	2.68	6.41
Leon	5.91	1.32	4.59	5.97	.39	5.58
Liberty	12.47	2.88	9.59	15.08	1.92	13.16
Madison	...*	...*	...*	18.90	.77	18.13
Montgomery	47.75	3.36	44.39	49.01	2.23	46.78
Newton	12.63	3.47	9.16	15.21	3.30	11.91
Orange	12.98	3.71	9.27	20.42	6.69	13.73
Polk	12.81	2.99	9.82	14.51	.84	13.67
Sabine	5.27	1.58	3.69	14.42	2.09	12.33
San Augustine	10.79	2.21	8.58	5.05	1.97	3.08
San Jacinto	16.26	3.05	13.21	16.59	2.45	14.14
Trinity	12.37	4.74	7.63	15.32	.24	15.08
Tyler	14.50	3.83	10.67	14.83	1.82	13.01
Walker	15.39	4.64	10.75	15.46	1.02	14.44
Waller	46.44	3.28	43.16	61.24	3.14	58.10
Northeast Texas wt. means†	8.89	2.00	6.89	10.96	1.11	9.85
Southeast Texas wt. means†	15.33	3.22	12.11	25.27	1.81	23.46
East Texas wt. means†	12.77	2.74	10.03	17.70	1.44	16.26

* No enrolled timberland in the appraisal district.

† Weights used to compute weighted means were acreage of enrolled timberland and nontimberland in each appraisal district.

caused nontimberland assessments to decline, on the average, by $911 per acre.

The greatest reduction in nontimberland taxes, $127.26 per acre, was observed in the Harris Appraisal District—an obvious reflection of the impact of the Houston metropolitan area. The smallest decrease, $2.59 per acre, occurred in the Panola Appraisal District. The average tax reductions, by subregion, were $9.85 per acre for northeast Texas and $23.46 per acre for southeast Texas. Across the entire east Texas area, the average decline in nontimberland taxes was $16.26 per acre.

The finding that use valuation was producing lower tax burdens for enrolled nontimberland than for enrolled timberland—$1.44 per acre as opposed to $2.74 per acre over the region as a whole—is inconsistent with results obtained in similar studies (Hickman 1982, Krietemeyer and others 1987). Generally, farming and ranching are considered to be land uses of a "higher order" than timber growing—i.e., the former uses are usually viewed as having a higher profit potential, which enables them to displace timber growing onto the poorest quality, and thus least valuable, sites. Under these circumstances, nontimberland taxes should exceed timberland taxes. Why this investigation indicates an opposite relationship is unclear, but at least two alternative explanations can be advanced.

One possible explanation is that agricultural income flows do indeed tend to be less than timber income flows throughout much of east Texas. Some evidence, both historical and contemporary, can be cited to support this observation. From a historical perspective, it is relevant to note that during the early 1900's a number of private entrepreneurs attempted to sell cut-over timberland to farmers; however, almost without exception, they met with failure (Maxwell and Baker 1983). At that time, the light, sandy soils of the east Texas pineywoods were best suited to growing trees (Maxwell and Baker 1983). From a contemporary perspective, it is relevant to note that the recently released report "The South's Fourth Forest: Alternatives for the Future." (USDA FS 1988) states that east Texas contained over 1.6 million acres of "marginal" crop and pasture land. These were defined as sites that would produce higher returns in timber production than in their present agricultural uses. The second possible explanation is that since farming and ranching are not the predominant land uses in east Texas, the input and product markets associated with these activities may not be as well-developed, or as active, as in some other areas. Given this situation, production costs could be higher and commodity prices lower than would be experienced elsewhere.

Effects on Revenues

The manner in which current-use assessment and all operative tax exemptions impact the revenues that could be collected by local units of government within the study area, given the underlying assumption of constant millage rates, is shown in table 7. As indicated, the aggregate revenue losses, in dollar terms, varied from a high of $301,717,598 in the Harris Appraisal District to a low of $649,339 in the Camp District. The districts that experienced the maximum and minimum losses, in percentage terms, were Waller and Jefferson, respectively. In the Waller Appraisal District, the estimated loss was 83.79 percent of the total revenue that could have potentially been collected. For the Jefferson Appraisal District, the comparable figure was 9.47 percent. The average percentage losses were 23.50 for the northeast subregion, 20.01 for the southeast subregion, and 20.53 for the east Texas area as a whole.

Use valuation of nontimberland was the primary cause of the revenue losses in 22 appraisal districts, as compared to operative exemptions in 11 districts and use valuation of timberland in 10 districts. The averages for northeast Texas indicate that, within this subregion, current-use assessment of nontimberland and operative exemptions were of roughly equal significance—both accounting for essentially 41 percent of the estimated revenue loss. The figures for southeast Texas indicate that operative exemptions were of paramount importance in that area—accounting for over 70 percent of the potential revenue forgone. In actuality, however, this result is largely attributable to the influence of the Harris Appraisal District. Of the 10 districts where use valuation of timberland was primarily responsible for the estimated revenue impacts, 9 are located in the southeast subregion. Over the entire east Texas area, it appears that operative exemptions were approximately six times more important, and current-use assessment of nontimberland approximately two times more important, than current-use assessment of timberland in accounting for the predicted revenue losses. Again, however, the influence of the Harris Appraisal District should be recognized. Without this district, the regionwide significance of each contributor would have been 46.35 percent for operative exemptions, 33.79 percent for use valuation of nontimberland, and 19.86 percent for use valuation of timberland.

Effects on Distribution of Tax Burden

The redistributional (i.e., tax-shifting) effects that occur as a consequence of current-use assessment and

Table 7.—*Impacts of Texas' current-use assessment program and operative exemptions on tax revenues raised, 1987*

Appraisal district	Potential revenue without current-use valuation and operative exemptions	Actual revenue with current-use valuation and operative exemptions	Revenue loss due to current-use valuation and operative exemptions	Revenue loss as percentage of potential revenue	Percentage of revenue loss due to		
					Current-use valuation of timberland	Current-use valuation of nontimberland	Operative exemptions
	Dollars			*Percent*			
Northeast Texas							
Anderson	23,371,527	15,739,790	7,631,737	32.65	12.08	52.16	35.76
Bowie	37,897,552	31,375,128	6,522,424	17.21	14.68	41.35	43.97
Camp	3,170,734	2,521,395	649,339	20.48	11.50	61.16	27.34
Cass	13,988,183	8,599,085	5,389,098	38.53	31.04	21.35	47.61
Cherokee	18,548,029	11,842,577	6,705,452	36.15	35.96	41.01	23.03
Franklin	5,993,901	4,225,052	1,768,849	29.51	7.79	64.06	28.15
Gregg	78,460,457	65,248,313	13,212,144	16.84	9.13	10.60	80.27
Harrison	32,585,385	27,761,283	4,824,102	14.80	31.97	24.45	43.58
Henderson	35,229,793	25,883,275	9,346,518	25.53	1.72	56.89	41.39
Marion	6,090,619	4,710,296	1,380,323	22.66	0	73.92	26.08
Morris	4,732,760	4,071,384	661,376	13.97	20.18	68.85	10.97
Nacogdoches	18,791,548	12,693,401	6,098,147	32.45	33.85	36.48	29.67
Panola	19,676,774	16,162,144	3,514,630	17.86	55.10	12.76	32.14
Red River	7,974,959	3,394,672	4,580,287	57.43	26.34	43.83	29.83
Rusk	34,939,861	27,170,740	7,769,121	22.24	22.82	40.96	36.22
Shelby	9,393,292	5,069,875	4,323,417	46.03	35.16	40.96	23.88
Smith	62,715,544	54,236,140	8,479,404	13.52	13.16	62.78	24.06
Titus	15,769,068	13,214,132	2,554,936	16.20	3.27	65.90	30.83
Upshur	16,602,163	9,981,658	6,620,505	39.88	20.27	24.24	55.49
Van Zandt	21,031,694	12,731,295	8,300,399	39.47	.03	67.67	32.30
Wood	21,987,044	17,392,728	4,594,316	20.90	9.45	41.33	49.22
Southeast Texas							
Angelina	26,480,829	20,964,569	5,516,260	20.83	39.95	23.13	36.92
Chambers	39,688,255	35,333,518	4,354,737	10.97	2.68	52.11	45.21
Grimes	44,645,247	22,338,511	22,306,736	49.96	11.82	82.73	5.45
Hardin	26,258,955	16,788,736	9,470,219	36.06	43.10	8.56	48.34
Harris	1,962,123,719	1,660,406,121	301,717,598	15.38	.85	8.83	90.32
Houston	10,780,009	5,763,374	5,016,635	46.54	22.57	61.05	16.38
Jasper	16,349,306	10,371,424	5,977,882	36.56	59.94	10.68	29.38
Jefferson	183,971,532	166,548,624	17,422,908	9.47	.64	11.37	87.99
Leon	10,755,370	6,482,369	4,273,001	39.73	1.38	81.41	17.21
Liberty	30,621,132	22,175,389	8,445,743	27.58	32.68	49.97	17.35
Madison	10,663,124	4,534,007	6,129,117	57.48	0	93.23	6.77
Montgomery	137,308,735	117,927,324	19,381,411	14.12	61.92	23.93	14.15
Newton	11,619,093	5,524,601	6,094,492	52.45	78.18	7.20	14.62
Orange	51,002,578	43,859,484	7,143,094	14.01	9.60	11.45	78.95
Polk	20,226,940	13,369,759	6,857,181	33.90	66.11	20.67	13.22
Sabine	3,252,799	1,999,249	1,253,550	38.54	47.16	28.30	24.54
San Augustine	3,943,136	2,111,584	1,831,552	46.45	79.69	14.31	6.00
San Jacinto	13,517,834	8,672,110	4,845,724	35.85	47.31	19.38	33.31
Trinity	9,401,261	5,055,668	4,345,593	46.22	37.18	47.20	15.62
Tyler	15,015,560	6,504,121	8,511,439	56.68	62.92	14.38	22.70
Walker	21,546,630	16,745,147	4,801,483	22.28	33.04	58.22	8.74
Waller	116,609,106	18,903,370	97,705,736	83.79	.61	20.22	79.17
Northeast Texaś totals	488,950,887	374,024,363	114,926,524	23.50	18.01	41.11	40.88
Southeast Texas totals	2,765,781,150	2,212,379,059	553,402,091	20.01	9.89	18.66	71.45
East Texas totals	3,254,732,037	2,586,403,422	668,328,615	20.53	11.28	22.52	66.20

all operative tax exemptions, given the assumption that local governments will adjust millage rates so as to stabilize revenues, are shown in table 8. As indicated, the largest dollar shift of $255,234,048 was observed in the Harris Appraisal District, and the smallest of $490,900 was in the Camp Appraisal District. The dollar shifts, when expressed as proportions of the revenues being raised, ranged from a high of 78.86 percent in the Waller Appraisal District to a low of 9.42 percent in the Jefferson District. The average percentage shifts, by subregion, were 21.20 for northeast Texas and 16.57 for southeast Texas. It is estimated that, over the entire study area, the aggregate tax burden on ineligible and nonparticipating property was increased by $445,848,665, or 17.24 percent, because of use assessment and all operative exemptions.

Of the 43 appraisal districts studied, use valuation of nontimberland was the principal cause of tax shifting in 22, operative exemptions in 11, and use valuation of timberland in 10. In the northeast subregion, 43.65 percent of estimated tax shifting was due to operative exemptions, 40.32 percent to use assessment of nontimberland, and 16.03 percent to use assessment of timberland. The comparable figures for the southeast subregion were 75.89, 15.75, and 8.36 percent, respectively. Over the east Texas area as a whole, operative exemptions accounted for the largest proportion of the additional taxes shifted onto ineligible and nonparticipating property—70.16 percent. The proportions attributable to use valuation were 9.72 percent for the extension of such treatment to timberland and 20.12 percent for the extension of such treatment to nontimberland.

In interpreting the figures for the southeast subregion and the total study area, the impact of the Harris Appraisal District, where the city of Houston is located, must be considered. If the totals for the entire east Texas region are adjusted to exclude this district, the aggregate tax shift drops to $190,614,617, and the proportions attributable to each causal factor become 43.13 percent for operative exemptions, 35.26 percent for use valuation of nontimberland, and 21.61 percent for use valuation of timberland.

Program Effectiveness

The results of the correlation analyses that were conducted to evaluate the effectiveness of Texas' current-use assessment programs are summarized in table 9. For performance element 1 (i.e., the relationship between levels of tax relief and levels of urbanization), the testing indicated that, in both subregions as well as the entire study area, the tax benefits associated with use assessment (as measured by the average reduction in per acre taxes) were significantly and positively correlated, at the $\alpha = 0.05$ level, with the degree of urbanization (as measured by the population per square mile or percentage of population classified as urban). This finding is indicative of proper program performance. Tax relief should be greater in more urbanized appraisal districts since these are where the pressures for development are strongest.

For performance element 2 (i.e., the relationship between levels of participation and levels of urbanization), the testing indicated that, except in the northeast subregion, the extent of participation (as measured by the proportion of all eligible land enrolled) was significantly and inversely correlated, at the $\alpha = 0.05$ level, with the degree of urbanization (urbanization again measured by the population per square mile or the percentage of population classified as urban). This finding is indicative of improper program performance in all but the northeast Texas area. Ideally, enrollments should be higher in more urbanized appraisal districts. While participation alone is not sufficient to insure that use assessment will preserve rural land, programs built upon this incentive are clearly doomed to failure without enrollees. The fact that participation appears to be less in the more urbanized appraisal districts probably reflects a greater unwillingness of property owners in those areas to elect current-use assessment. Many likely see opportunities in the near future for sale and/or development and desire to avoid the rollback tax penalties that would be imposed if they enrolled and then subsequently withdrew. This phenomenon has been noted by other investigators (Atkinson 1977, Coughlin and others 1978, Keene and others 1976). The reasons why no significant correlations were observed in the northeast subregion are unclear. One possible explanation is that development pressures in northeast Texas are not as strong as they are in the southeastern part of the State. In the latter area, the Houston-Beaumont-Orange metroplex unquestionably has a wide-ranging impact on rural property values. Another factor that might be influencing participation levels within individual appraisal districts in both subregions is the attitude of local property tax administrative officials. When these officials are supportive of use valuation, enrollments tend to be higher than would be true if they were antagonistic (Hickman 1982). In east Texas, it is conceivable that antagonistic officials tend to be concentrated in the more urbanized appraisal districts. After all, these districts are the ones that typically experience the most pronounced tax revenue and tax-shifting impacts when use assessment is implemented.

Finally, for the third element of program performance (i.e., the relationship between levels of program withdrawals and levels of urbanization) the testing indicated that, as a general rule, the magnitude of withdrawals (as measured by rollback taxes collected or the estimated acreage withdrawn) is not significantly greater, at the $\alpha = 0.05$ level, in more urbanized

Table 8.—*Impacts of Texas' current-use assessment program and operative exemptions on taxes borne by ineligible and nonparticipating (IE & NP) property, 1987*

Appraisal district	Actual revenue raised	Tax borne by IE & NP property without current-use valuation and operative exemptions	Tax borne by IE & NP property with current-use valuation and operative exemptions	Tax shifted to IE & NP property due to current-use valuation and operative exemptions	Tax shifted as percentage of revenue raised	Percentage of tax shift due to		
						Current-use valuation of timberland	Current-use valuation of nontimberland	Operative exemptions
	Dollars				*Percent*			
Northeast Texas								
Anderson	15,739,790	10,082,308	14,971,202	4,888,894	31.06	10.18	52.22	37.60
Bowie	31,375,128	25,463,052	30,756,406	5,293,354	16.87	14.25	40.89	44.86
Camp	2,521,395	1,906,319	2,397,219	490,900	19.47	10.01	61.24	28.75
Cass	8,599,085	4,804,225	7,815,147	3,010,922	35.01	26.61	21.01	52.38
Cherokee	11,842,577	6,804,952	10,658,030	3,853,078	32.53	32.17	42.25	25.58
Franklin	4,225,052	2,827,489	4,011,183	1,183,694	28.02	7.80	62.55	29.65
Gregg	65,248,313	54,158,430	65,125,231	10,966,801	16.81	9.02	10.55	80.43
Harrison	27,761,283	23,262,483	27,304,812	4,042,329	14.56	31.44	24.25	44.31
Henderson	25,883,275	18,691,901	25,441,597	6,749,696	26.08	1.58	56.31	42.11
Marion	4,710,296	3,494,054	4,517,904	1,023,850	21.74	0	72.80	27.20
Morris	4,071,384	3,453,154	3,991,940	538,786	13.23	20.76	67.60	11.64
Nacogdoches	12,693,401	7,835,922	11,600,075	3,764,153	29.65	30.03	37.50	32.47
Panola	16,162,144	12,731,345	15,499,836	2,768,491	17.13	54.03	12.45	33.52
Red River	3,394,672	1,154,076	2,711,044	1,556,968	45.86	23.66	38.98	37.36
Rusk	27,170,740	20,625,953	26,524,049	5,898,096	21.71	21.96	40.94	37.10
Shelby	5,069,875	2,219,216	4,226,559	2,007,343	39.59	26.68	46.30	27.02
Smith	54,236,140	46,339,830	53,584,769	7,244,939	13.36	12.83	62.83	24.35
Titus	13,214,132	10,956,210	13,074,611	2,118,401	16.03	3.23	65.62	31.15
Upshur	9,981,658	5,645,194	9,389,577	3,744,383	37.51	17.66	23.35	58.99
Van Zandt	12,731,295	7,568,598	12,170,572	4,601,974	36.15	.02	63.75	36.23
Wood	17,392,728	13,426,046	16,972,712	3,546,666	20.39	8.83	40.73	50.44
Southeast Texas								
Angelina	20,964,569	15,919,731	20,108,686	4,188,955	19.98	38.53	22.98	38.49
Chambers	35,333,518	31,109,756	34,944,039	3,834,283	10.85	2.64	51.65	45.71
Grimes	22,338,511	10,491,315	20,968,094	10,476,779	46.90	11.24	82.95	5.81
Hardin	16,788,736	9,431,629	14,752,143	5,320,514	31.69	37.53	7.45	55.02
Harris	1,660,406,121	1,404,628,489	1,659,862,537	255,234,048	15.37	.84	8.81	90.35
Houston	5,763,374	2,752,490	5,148,393	2,395,903	41.57	17.32	64.35	18.33
Jasper	10,371,424	5,665,435	8,931,257	3,265,822	31.49	54.67	11.21	34.12
Jefferson	166,548,624	149,972,589	165,661,161	15,688,572	9.42	.61	10.93	88.46
Leon	6,482,369	3,748,770	6,219,984	2,471,214	38.12	1.17	80.90	17.93
Liberty	22,175,389	15,012,808	20,730,995	5,718,187	25.79	30.96	50.49	18.55
Madison	4,534,007	1,825,351	4,292,587	2,467,236	54.42	0	92.85	7.15
Montgomery	117,927,324	100,311,256	116,797,471	16,486,215	13.98	61.75	23.97	14.28
Newton	5,524,601	1,710,218	3,597,179	1,886,961	34.16	69.87	7.67	22.46
Orange	43,859,484	37,137,884	43,186,440	6,048,556	13.79	9.11	10.71	80.18
Polk	13,369,759	7,866,619	11,901,021	4,034,402	30.18	62.65	22.49	14.86
Sabine	1,999,249	1,036,196	1,685,918	649,722	32.50	40.90	30.00	29.10
San Augustine	2,111,584	839,473	1,567,541	728,068	34.48	83.37	8.55	8.08
San Jacinto	8,672,110	5,120,127	7,980,879	2,860,752	32.99	44.79	19.02	36.19
Trinity	5,055,668	2,160,765	4,018,299	1,857,534	36.74	21.79	58.56	19.65
Tyler	6,504,121	1,909,931	4,409,604	2,499,673	38.43	49.20	17.32	33.48
Walker	16,745,147	12,328,507	15,863,628	3,535,121	21.11	30.56	60.21	9.23
Waller	18,903,370	2,884,000	17,790,430	14,906,430	78.86	.39	15.48	84.13
Northeast Texas totals	374,024,363	283,450,757	362,744,475	79,293,718	21.20	16.03	40.32	43.65
Southeast Texas totals	2,212,379,059	1,823,863,339	2,190,418,286	366,554,947	16.57	8.36	15.75	75.89
East Texas totals	2,586,403,422	2,107,314,096	2,553,162,761	445,848,665	17.24	9.72	20.12	70.16

Table 9.—*Results of correlation testing relative to the effectiveness of Texas' current-use assessment program*

Variables correlated	Area considered				
	Northeast Texas	Southeast Texas	East Texas	Southeast Texas excluding Harris Appraisal District	East Texas excluding Harris Appraisal District
Population per sq. mi. and average reduction in per acre taxes	0.7247*	0.8264*	0.8122*	. . .	. . .
Percentage of population classified as urban and average reduction in per acre taxes	.5123*	.4855*	.3920*	. . .	. . .
Population per sq. mi. and percentage of eligible land enrolled in current-use	−.1814	−.7948*	−.5664*	. . .	. . .
Percentage of population classified as urban and percentage of eligible land enrolled in current-use	−.0852	−.5067*	−.3702*	. . .	. . .
Population per sq. mi. and rollback taxes collected in 1987	.0180	.9142*	.8712*	0.1249	0.0680
Percentage of population classified as urban and rollback taxes collected in 1987	−.1801	.4620*	.3340*	−.0385	−.1143
Population per sq. mi. and estimated acres withdrawn in 1987	−.0403	.1792	.1562	. . .	. . .
Percentage of population classified as urban and estimated acres withdrawn in 1987	−.2405	.0974	−.0246	. . .	. . .

* Indicates a relationship that is significant at the 0.05 level.

appraisal districts (urbanization measured as in previous analyses).[11] This finding is indicative of proper program performance and implies that, even in appraisal districts where development pressures are substantial, those landowners who elect current-use assessment are just as inclined as participants elsewhere to remain under the program. However, since enrollments were determined to be inversely related to the degree of urbanization, this evidence on withdrawals is not nearly as meaningful as it otherwise would be in terms of suggesting that use assessment is impacting rural land use decisions in the manner intended.

[11] A close review of table 9 shows that for the southeast subregion, and the study area as a whole, initial testing revealed a strong positive relationship between the magnitude of withdrawals (as measured by the amount of rollback taxes collected) and the degree of urbanization. The data, however, suggest that this result was probably attributable to the inclusion of the figures for the Harris Appraisal District. This conclusion was confirmed by repeating the computations with the information for the Harris District excluded.

CONCLUSIONS

The study results lead to the following conclusions, which relate directly to the objectives of the investigation.

1. Current-use assessment has been widely adopted by eligible east Texas property owners. Across the region as a whole, 86.2 percent of all qualifying land was being valued on this basis in 1987. Nontimberland enrollments exceeded timberland enrollments by a substantial margin in the northeastern part of the State—4.9 million as opposed to 3.0 million acres—but in the southeast the two land uses were about equally represented—4.5 million as opposed to 4.4 million acres.
2. Property owners who have elected current-use are receiving significant tax relief. As a general rule, participating nontimberland owners are deriving greater benefits than participating timberland owners. Across the entire east Texas area, the average decline in taxes for enrolled

nontimberland was $16.26 per acre. For enrolled timberland, the comparable figure was $10.03 per acre. The average use value taxes for each type of land were $1.44 and $2.74 per acre, respectively.

3. The revenue impacts traceable to Texas' current-use assessment programs, if analyzed under the assumption of constant millage rates, are sizeable. However, these impacts are not large when compared to those arising from the various tax exemptions authorized by State law. Across the east Texas area as a whole, because of current-use assessment and all operative exemptions, tax revenues actually collected were $668,328,615 less than those potentially collectible. Exemptions accounted for 66 percent of this loss, use valuation of nontimberland for 23 percent, and use valuation of timberland for 11 percent.
4. The redistributional (i.e., tax-shifting) effects of Texas' current-use assessment programs, if analyzed under the assumption that millage rates will be adjusted so as to stabilize revenues, are considerable. However, as was true with the revenue impacts, these effects are not large when compared to those attributable to the various tax exemptions authorized by State law. Across the entire study area, because of current-use assessment and all operative exemptions, the tax burden on ineligible and nonparticipating property was increased by $445,848,665. Exemptions accounted for 70 percent of this increment, use valuation of nontimberland for 20 percent, and use valuation of timberland for 10 percent.
5. Texas' current-use assessment programs are functioning properly in that they are providing the greatest tax relief in those areas where development pressures are most intense. However, the effectiveness of the programs in encouraging the retention of farm and forest land in its traditional uses is unclear. On the negative side, participation levels appear to be somewhat lower in more urbanized appraisal districts. On the positive side, withdrawals do not appear to be concentrated in those areas where the threat of development is most imminent.

In summary, the study results indicate that Texas' current-use assessment programs are widely utilized and are providing significant tax relief to participating property owners in east Texas. In many instances, this relief is probably making continued farming and/or forestry profitable when it otherwise would not be. The costs of providing this relief—in terms of both the potential revenues forgone and the redistribution of the tax burden among different classes of taxable property—are substantial when viewed alone. These costs, however, are not large in relation to those associated with the various tax exemptions granted under State law. Of the costs directly attributable to current-use assessment, most are a consequence of extending such treatment to nontimberland. Left unanswered is the question of how Texas' current-use programs are affecting rural land use decisions. Since the evidence obtained here was inconclusive, this issue will have to be resolved through further research.

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Those provisions of Texas law that authorize optional current-use property tax assessment for forest and other rural land were studied to: (1) estimate the extent of adoption by qualifying property owners, (2) estimate the effects on assessments and taxes of enrolled land, (3) estimate the impacts on revenues received by local units of government, (4) estimate the effects on taxes born by ineligible and nonparticipating property owners, and (5) evaluate the impacts on rural land use decisions. The study focused on the east Texas pineywoods region because of the continuing controversy that has surrounded the application of current-use assessment within this heavily timbered part of the State.

Keywords: Forest economics, property taxation.