

*The* NCREIF Timberland  
Property Index

Research Notes *2003*



## Timberland Index Developed to Help Investors and Advisors Make Better-Informed Decisions

**T**his research note describes the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Property Index. It provides some background information on the development of the NCREIF Timberland Property Index, discusses the methodology used by the Index to calculate investment performance, and presents annual performance results through 2002.

Timber real estate investors and investment advisors have long desired an independent, industry-wide measure of timberland returns based on the actual performance of managed tree farms.

To satisfy this need, the Hancock Timber Resource Group, Forest Investment Associates and Prudential Timber Investments joined forces in early 1992 with NCREIF (an organization of investment managers, pension plan sponsors, academicians, consultants, appraisers and accountants who have significant involvement in pension fund real estate investments) and the Frank Russell Company (a leading investment consultant to pension funds) to develop the NCREIF Timberland Property Index.

After more than two years of preparatory effort, NCREIF commenced publication of its Timberland Property Index in late 1994.

Dr. Clark Binkley, then Dean of the University of British Columbia's Faculty of Forestry and now Managing Director and Chief Investment Officer of the Hancock Timber Resource Group, was engaged by NCREIF to review the Timberland Property Index methodology and results. Excerpts from the Executive Summary of Dr. Binkley's review read as follows:

*The NCREIF Timberland Index is based on generally accepted measures of asset valuation. The reported income and appreciation return series conform to theoretically appropriate concepts of asset returns. NCREIF's implementation of these concepts apparently introduces no biases in the results, and generally insures accurate reporting of the data provided by the property management organizations.*

*The actual returns from any timberland property depend on an enormous array of ecological conditions, local economic factors and the forestry skills of the property manager. As a consequence, no small sample of properties can accurately measure the returns that would be expected over such vast regions as the U.S. South or the U.S. Pacific Northwest. However, the data in the NCREIF Timberland Index do reliably represent the returns that have been possible from generally well-managed, industrial-grade timberlands in each region. When used in conjunction with experienced judgment and confirmed by sound analysis of specific investment opportunities, the NCREIF Timberland Index provides useful historical measures of the level and variability of timberland returns in both the U.S. South and in the U.S. Pacific Northwest.*

## Performance Calculations Designed to Facilitate “Apples-to-Apples” Comparisons

The Timberland Property Index is patterned after the NCREIF Property Index for commercial real estate. The timberland investment managers contribute information each quarter on appraised value, net income, capitalized expenses and any partial sales or purchases for every property in the United States they manage that satisfies the criteria for inclusion in the Index. To qualify for the Index, a property must be held in a fiduciary environment and “marked-to-market” at least once per year. NCREIF banks these data, and then aggregates the property-level information to produce quarterly rates of return for the asset class.

Like the commercial real estate Property Index, the Timberland Property Index separates the total return into income and capital components. (The income return for timberland is called EBITDDA return, which stands for earnings before interest expenses, income taxes, depreciation, depletion and amortization.) This approach allows for an “apples-to-apples” comparison of the historical performance of timber real estate, commercial real estate, stocks and bonds.

The return formulae for the timberland and commercial real estate indices are compared in Table 1. Although the formulae are similar, there are two noteworthy differences. First, the Timberland Property Index includes a variable to capture the addition of more land to a tree farm through “partial purchases.” Second, one-half of net income is subtracted from the denominator in the Timberland Property Index to reflect an assumption that revenues from timber harvests are received randomly throughout each quarter. In the commercial Property Index, one-third of net income is subtracted from the denominator to reflect an assumption that lease payments are received monthly.

Table 1  
NCREIF Performance Calculations

	Timberland Property Index	Commercial Property Index
EBITDDA or Income Return	$\frac{\text{EBITDDA}_t}{\text{MV}_{t-1} + 0.5(\text{CI}_t - \text{PS}_t + \text{PP}_t - \text{EBITDDA}_t)}$	$\frac{\text{I}_t}{\text{MV}_{t-1} + 0.5(\text{CI}_t - \text{PS}_t) - 0.33\text{I}_t}$
Capital Return	$\frac{\text{MV}_t - \text{MV}_{t-1} - \text{CI}_t + \text{PS}_t - \text{PP}_t}{\text{MV}_{t-1} + 0.5(\text{CI}_t - \text{PS}_t + \text{PP}_t - \text{EBITDDA}_t)}$	$\frac{\text{MV}_t - \text{MV}_{t-1} - \text{CI}_t + \text{PS}_t}{\text{MV}_{t-1} + 0.5(\text{CI}_t - \text{PS}_t) - 0.33\text{I}_t}$

where

$\text{EBITDDA}_t$  = net operating revenue obtained from tree farm (primarily from timber sales) during quarter t

$\text{CI}_t$  = capitalized expenditures on tree farm (e.g., forest regeneration and road construction) during quarter t

$\text{PS}_t$  = net proceeds from sales of land (with or without timber) from tree farm during quarter t

$\text{PP}_t$  = gross costs of adding land (with or without timber) to tree farm during quarter t

$\text{MV}_t$  = market value of tree farm at end of quarter t

where

$\text{I}_t$  = net operating income generated by commercial property (primarily from leases) during quarter t

$\text{CI}_t$  = capitalized expenditures on commercial property during quarter t

$\text{PS}_t$  = net proceeds from partial sales of commercial property (e.g., easements, parcels of land, and selected buildings in an industrial park) during quarter t

$\text{MV}_t$  = market value of commercial property at end of quarter t

## Historical Performance Results

The Timberland Property Index extends back to 1987. Institutional ownership of timberland was not sufficient to develop a robust measure of performance in earlier years.

The sample of properties in the Index includes tree farms in the South (Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas and Oklahoma), the Pacific Northwest (Washington, Oregon and California), and the Northeast (Maine, New Hampshire, Vermont, New York and Pennsylvania). Subindex results are reported for each region.

**Annual rates of return calculated from the Timberland Property Index during the period 1987-2002 are shown in Table 2.**

**Table 2**  
NCREIF Timberland Property Index Performance Results (before fees)

	Year	Property Count	Market Value (\$ millions)	EBITDDA Return (% per year)	Capital Return (% per year)	Total Return (% per year)
<b>All Regions</b>	1987	10	118.7	10.4	15.2	26.5
	1988	22	297.9	10.3	18.4	30.1
	1989	31	518.9	9.8	25.8	37.4
	1990	37	745.7	8.2	2.7	11.1
	1991	46	1,035.5	8.1	11.5	20.3
	1992	62	1,545.4	7.3	28.6	37.3
	1993	76	1,790.8	6.7	15.1	22.4
	1994	95	1,973.0	6.7	8.4	15.4
	1995	112	2,168.6	7.5	6.0	13.8
	1996	126	2,477.1	6.5	4.0	10.7
	1997	134	3,003.8	6.9	11.4	18.9
	1998	147	3,606.7	5.2	3.7	9.1
	1999	145	3,336.7	4.2	8.4	12.9
	2000	148	3,558.1	4.7	-0.2	4.4
2001	163	3,592.3	3.4	-8.5	-5.2	
2002	255	4,887.0	4.0	-2.1	1.8	
<b>Pacific Northwest</b>	1987	3	56.3	19.6	15.0	36.3
	1988	4	100.7	29.1	33.9	71.1
	1989	5	246.7	18.4	50.1	74.4
	1990	8	343.2	13.5	-5.1	7.8
	1991	12	542.0	13.8	14.7	29.9
	1992	17	912.7	10.0	47.1	60.5
	1993	17	954.0	9.4	17.2	27.3
	1994	15	856.0	8.5	2.1	10.7
	1995	17	837.9	10.6	4.3	15.3
	1996	22	967.2	9.6	-0.7	8.9
	1997	24	1,119.0	9.2	2.2	11.6
	1998	25	1,064.2	6.2	-8.5	-2.7
	1999	23	1,096.0	6.2	7.2	13.7
	2000	23	1,016.8	7.9	0.4	8.3
2001	23	873.7	6.0	-13.7	-8.4	
2002	21	872.0	6.4	-7.2	-1.1	
<b>South</b>	1987	7	62.4	3.1	10.8	14.1
	1988	18	197.2	2.5	11.2	14.0
	1989	26	272.2	3.2	9.1	12.6
	1990	29	402.5	2.8	10.5	13.6
	1991	34	493.4	2.5	8.3	10.8
	1992	45	632.7	4.2	8.7	13.1
	1993	59	836.9	3.2	11.6	15.1
	1994	71	1,045.8	5.2	14.4	20.0
	1995	84	1,227.4	5.4	8.1	13.7
	1996	92	1,379.1	4.4	6.9	11.5
	1997	96	1,720.9	5.1	18.5	24.3
	1998	104	1,977.6	4.5	6.1	10.7
	1999	105	1,962.8	3.1	3.9	7.1
	2000	108	2,286.6	3.2	-0.9	2.3
2001	124	2,485.7	2.4	-6.4	-4.1	
2002	215	3,797.7	3.3	-1.0	2.3	
<b>Northeast</b>	1994	9	71.2	1.7	12.1	14.0
	1995	11	103.5	5.7	-2.4	3.3
	1996	12	130.8	7.4	9.7	17.6
	1997	14	163.8	8.7	8.9	18.1
	1998	18	549.5	7.0	26.4	34.9
	1999	17	278.0	4.6	28.8	34.3
	2000	17	254.8	4.8	2.6	7.5
	2001	16	232.8	3.2	-9.2	-6.2
2002	14	194.5	5.2	-2.3	2.8	

Note: Although EBITDDA and capital returns sum to the total return over quarters, they do not sum over years due to inter-quarter compounding of each component. Historic timberland performance figures should not be construed as guarantees of future returns. Potential for profit as well as for loss exists. The impact of future economic, market and weather factors may adversely affect timberland performance. Some timberland investments managed by HTRG had results materially different from those portrayed here for the asset class as a whole.

As Dr. Binkley noted in his review, the lack of quarterly appraisals for many properties in the Timberland Property Index renders the quarterly return series less useful than the annual ones. Thus, this report focuses on annual rates of return.

At the conclusion of 2002, the sample of tree farms comprising the Timberland Property Index were valued at \$4.9 billion. The properties were concentrated in the South (\$3.8 billion) and Pacific Northwest (\$872 million) regions. The Index also contained \$195 million of timberland—housed in 14 tree farms—in the northeastern states. This sample represents roughly one-third of the market value of U.S. timberland held by institutions.

The Timberland Property Index confirms that timber real estate has generated strong returns during the past 16 years. Since inception, the total return for all regions has been 16.1 percent per year; the annual income component has been 6.8 percent.

These aggregate results mask substantial differences in the historical performance of timber real estate in western and southern regions. Rates of return in the Pacific Northwest have been higher than in the South, but also more variable. EBITDDA returns have also been higher in the Pacific Northwest than in the South. This difference is partly the result of the relatively young age of the timber on many southern tree farms. EBITDDA returns in the South will continue to rise as the timber matures.

## Historical Performance Results for Hancock Timber Resource Group Properties

The Hancock Timber Resource Group has developed a system to apply the NCREIF calculations to any subset of properties that we manage. This raises the possibility of using the Timberland Property Index as a performance benchmark. However, as Dr. Binkley noted in his review, the performance of any individual tree farm depends on a wide array of factors such as the age structure of the timber inventory, local timber market conditions, property size and appraisal assumptions. These factors might cause the rate of return generated by an individual tree farm, or portfolio of tree farms, to differ substantially from the overall Index. Thus, use of the Timberland Property Index as a performance benchmark should proceed with caution.

Table 3 presents performance results for all properties that the Hancock Timber Resource Group contributes to the Timberland Property Index.

**Table 3**  
**NCREIF Timberland Property Index Performance Results (before fees)**  
**All Tree Farms contributed by the Hancock Timber Resource Group**

	Year	Property Count	Market Value (\$ millions)	EBITDDA Return (% per year)	Capital Return (% per year)	Total Return (% per year)
<b>All Regions</b>	1987	5	99.5	11.4	13.7	26.0
	1988	9	242.9	11.4	20.0	33.2
	1989	14	447.6	10.5	26.1	38.5
	1990	18	664.0	8.6	3.3	12.1
	1991	26	949.1	8.5	12.2	21.4
	1992	35	1,388.7	7.4	31.1	40.2
	1993	42	1,558.0	7.0	15.0	22.5
	1994	53	1,677.5	6.9	8.0	15.3
	1995	67	1,842.4	8.1	6.8	15.3
	1996	72	2,052.4	7.1	2.7	10.0
	1997	79	2,523.5	7.5	11.0	19.1
	1998	84	2,630.9	5.6	0.2	5.8
	1999	82	2,491.7	4.8	5.8	10.8
2000	73	2,128.5	4.7	0.9	5.6	
2001	68	1,909.2	3.7	-6.8	-3.2	
2002	71	1,893.5	3.8	-1.0	2.8	
<b>Pacific Northwest</b>	1987	3	56.3	19.6	15.0	36.3
	1988	4	100.7	29.1	33.9	71.1
	1989	5	246.7	18.4	50.1	74.4
	1990	8	343.2	13.5	-5.1	7.8
	1991	12	542.0	13.8	14.7	29.9
	1992	17	912.7	10.0	47.1	60.5
	1993	17	954.0	9.4	17.2	27.3
	1994	15	856.0	8.5	2.1	10.7
	1995	17	837.9	10.6	4.3	15.3
	1996	22	967.6	9.6	-0.7	8.9
	1997	24	1,119.0	9.3	2.2	11.6
	1998	25	1,064.2	6.2	-8.5	-2.7
	1999	19	877.1	6.4	8.2	15.0
2000	12	353.6	10.0	2.6	12.9	
2001	11	306.4	9.1	-10.3	-1.9	
2002	11	287.1	6.4	-6.4	-0.2	
<b>South</b>	1987	2	43.2	3.3	9.4	12.8
	1988	5	142.2	2.3	11.7	14.2
	1989	9	200.9	2.5	5.7	8.3
	1990	10	320.8	2.3	14.0	16.4
	1991	14	407.1	2.2	9.1	11.5
	1992	18	476.0	3.9	8.8	12.9
	1993	25	604.0	2.9	10.6	13.7
	1994	29	750.3	5.2	15.8	21.4
	1995	39	900.6	5.8	10.3	16.6
	1996	39	959.4	4.9	5.2	10.2
	1997	43	1,252.8	5.4	20.9	27.1
	1998	45	1,376.2	4.7	7.6	12.6
	1999	50	1,418.5	3.2	3.2	6.5
2000	48	1,603.0	3.8	0.7	3.8	
2001	46	1,443.2	2.5	-6.6	-4.3	
2002	50	1,485.0	3.2	0.7	3.9	
<b>Northeast</b>	1994	9	71.2	1.7	12.1	14.0
	1995	11	103.5	5.7	-2.4	3.3
	1996	11	125.5	7.8	9.9	18.2
	1997	12	151.7	9.1	7.3	16.9
	1998	14	177.1	8.9	3.7	12.9
	1999	13	196.1	9.1	15.0	25.1
	2000	13	171.9	7.0	-1.5	5.3
	2001	11	159.6	4.8	-0.8	4.0
2002	10	121.4	4.5	-7.6	-3.3	

Note: Although EBITDDA and capital returns sum to the total return over quarters, they do not sum over years due to inter-quarter compounding of each component. Historic timberland performance figures should not be construed as guarantees of future returns. Potential for profit as well as for loss exists. The impact of future economic, market and weather factors may adversely affect timberland performance. Some timberland investments managed by HTRG had results materially different from those portrayed here for the asset class as a whole.

**In the Pacific Northwest, the Hancock Timber Resource Group was the only firm reporting performance data until 1999 so our results are quite similar to the overall Index results. In the**

South, and until 1998 in the Northeast, Hancock-managed properties have comprised the bulk of the market value of the Index. Consequently, the Hancock results in these regions are similar to the Timberland Property Index results.

## Conclusion

The NCREIF Timberland Property Index is an important step forward in our efforts to better understand the financial characteristics of timberland ownership. Its usefulness as a research tool will increase even further as more properties are added to the Index database and the performance record lengthens.

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