

**ABSTRACT**

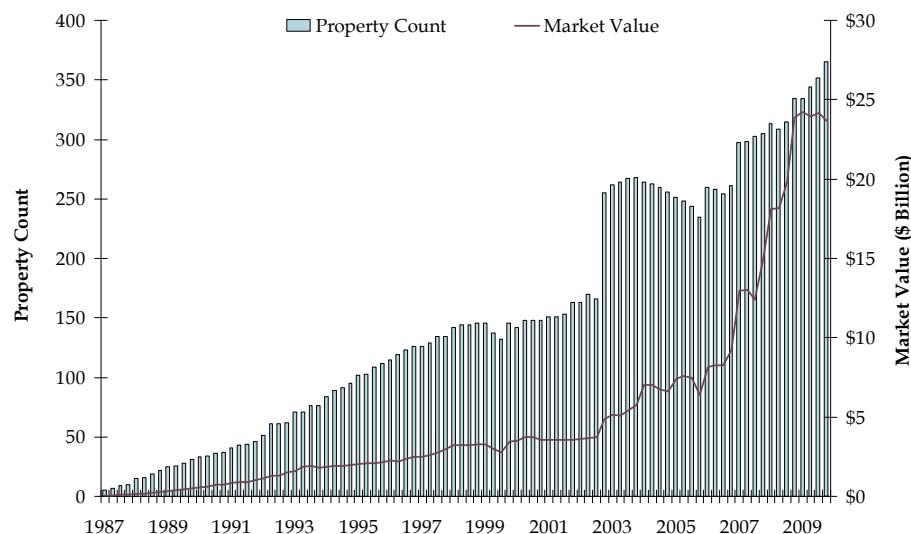
*Timberland (or “timber”) is an alternative investment that, in addition to solid risk-adjusted returns, may provide significant diversification benefits to a typical institutional portfolio. For this reason, Meketa Investment Group recommends that long-term investors invest a percentage (10-40%) of their natural resources allocation to a diversified portfolio of private timberland vehicles.*

**OVERVIEW**

Investments in timberland generally take the form of ownership of land on which trees are grown and harvested. These harvested trees are then sold on the open market, providing income to the investor. At some point in the future, the timberland is either sold to new investors, or to a commercial or residential real estate development group.

Timberland was first introduced as a distinct institutional asset class in the 1980s. The decades since have seen rapid growth in the property count and value of timberland privately held by investors (see Figure 1)—the NCREIF timberland index, which is a representative subset of timberland properties, rose from a few dozen properties worth \$570 million in 1990 to over 360 properties worth almost \$24 billion as of 2009. Timberland investments have become an increasingly common component of investors’ portfolios for good reason: timberland has historically provided solid risk-adjusted returns and significant diversification benefits (see Table 1). Since 1987, timber has on average returned 14.1% per annum with an annualized standard deviation of 9.4%. While some portion surely stems from increased investor awareness and participation, timberland returns compare favorably with many other common asset classes, including domestic equities and real estate. At the same time, timberland’s returns have been essentially uncorrelated with other asset classes — even commodities. Though history may not be an accurate guide to the future, past high risk-adjusted returns and low correlations imply that a timber investment may improve the risk-adjusted performance of an investor’s portfolio.

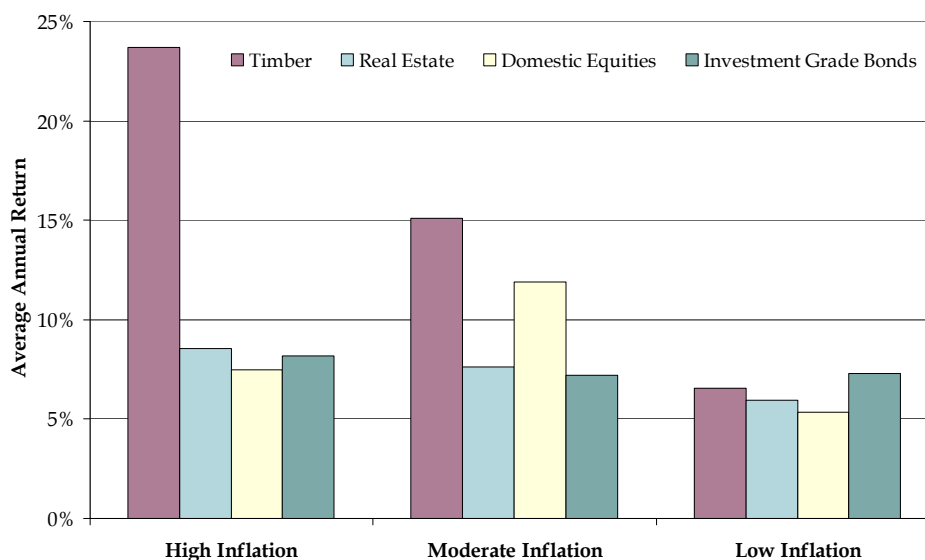
**Figure 1.** Growth in number and value of timberland properties. Source: NCREIF.



**Table 1.** Historical timberland return, risk, and correlation statistics.

Asset Class <sup>1</sup>	Annualized Return (%)	Annualized Std. Dev. (%)	Correlation with Timberland
Domestic Equities	9.3%	18.8%	0.03
Investment Grade Bonds	7.2%	4.6%	0.14
Real Estate	6.8%	5.1%	0.01
Commodities <sup>2</sup>	5.5%	17.0%	-0.10
<b>Timberland</b>	<b>14.1%</b>	<b>9.4%</b>	1.00

Timberland may also provide a hedge against consumer price inflation (see Figure 2). During periods of high inflation, timberland returned 23.7% on average—well above its historical return of 14.1%. This compares favorably with other asset classes’ moderately positive (real estate, investment grade bonds) or negative (equities) responses to consumer price inflation.<sup>3</sup>

**Figure 2.** Relative asset class performance during inflation scenarios, defined as the top quintile (“high”), middle three quintiles (“moderate”), and the bottom quintile (“low”) of rolling 1-year consumer price inflation from 1987-2009.

<sup>1</sup> Proxied by the Russell 3000, Barclays U.S. Aggregate, NCREIF Property, Dow Jones-UBS Commodity, and NCREIF Timberland indices; data from 1Q 1987 through 4Q 2009 unless otherwise noted.

<sup>2</sup> All results for commodities use data starting in 1Q 1990, the inception date of the Dow Jones-UBS Commodity index.

<sup>3</sup> While real estate and investment grade bond returns were also higher than their historical averages during periods of high inflation, their outperformances relative to their historical averages were not as pronounced.

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## TIMBERLAND AS AN INVESTMENT

Institutional investors typically hire Timber Investment Management Organizations (TIMOs) to manage their timberland investments. These TIMOs own about 10% of investable timberland globally<sup>1</sup> and manage a wide variety of timber investments.

Timber investments are usually categorized by type of land (e.g., plantation, natural forest), type of tree (e.g., hardwood, softwood), country (e.g., domestic, international), and region or sub-region (e.g., West, Northeast). These categories are not usually independent because species are often land- and region-dependent. For example, the U.S. Pacific Northwest is populated by forests of Douglas fir, hemlock, cedar, and alder trees, while the U.S. South is more suited to plantations of loblolly pine. Nevertheless, while diversifying among the major timberland regions is often considered synonymous with species diversification, this is not always the case.

Each timberland category has distinct product markets and risks that call for specifically tailored investment strategies. For example, hardwoods are generally directed at higher value “niche” markets such as furniture or flooring, while softwoods are grown for commodity products such as structural lumber, plywood, and pulp. The majority of large timberland owners concentrate on plantation softwoods as these genetically selected pines or eucalyptus trees are fast-growing and inexpensive to harvest.

## RETURN DRIVERS

Timberland returns stem from four distinct sources: biological growth, timber prices, land values, and management strategy. Each of these drivers is described below.

### Biological Growth

Timberland as an asset class is unique in that it experiences biological growth of 2% to 8% per annum. That is, the volume of the timber on a parcel of land grows as the trees grow. Generally, the larger a tree’s volume, the more valuable it becomes. Even more importantly, this volume growth can be stored “on the stump” for long periods, which provides timberland owners the option to wait for better prices.

### Timber Prices

Timber (i.e., the actual wood product) pricing is the most volatile return component, and is influenced by such specific factors as the economic cycle, rainfall patterns, interest rates, currency exchange rates, and various other factors. More broadly speaking, however, prices are influenced by the twin factors of demand and supply.

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<sup>1</sup> Total investable timberland value is over \$100 billion globally, over \$78 billion of which is in the United States. Of privately owned U.S. timberland (\$41 billion in total), institutional investors own approximately 75%, while high net worth individuals and other investors own the rest.

Demand for timber is a direct function of global economic activity, which is generally expected to increase through world population growth and a global rise in per capita income. In particular, the growing wealth of emerging nations is translating into increased demand for wood-dependent products such as housing, furniture, containerboard, and newsprint. Furthermore, despite secular changes in demand arising from such factors as increases in paper recycling rates (now close to 50%) and e-commerce activity, demand for paper and pulpwood continues to grow.

At the same time that demand for its products is expected to increase, the supply of timberland is expected to stagnate. First, as a result of increasing environmental pressures, the gross amount of harvestable timberland acreage has been steadily declining. Second, in some areas of the U.S. the amount of forest land being lost to suburban sprawl and “fragmentation” for residential home sites has significantly exceeded reclaimed agricultural land for forestry uses<sup>1</sup>. (In general, if private forestland is considered more valuable when converted to other uses, it tends to be converted and is withdrawn from supply.)

Nevertheless, the harvestable amount of timber has remained fairly constant over the last fifty years due primarily to productivity and improvements in silviculture. Furthermore, in many countries such as New Zealand, Canada, and Russia, there remains a large source of untapped timberland. If the price of timber is high enough, there will be political pressure to convert this acreage to harvestable timberland.

### **Land Values**

Similar to timber prices, land values are related to local supply-and-demand dynamics and vary by market. However, land prices are *far* less volatile than timber pricing, and serves as a buffer to volatility.

Land values themselves typically have the least impact on timberland returns—with some exceptions. In some cases, land can be managed to acquire “higher and better use” (HBU) advantages, in the sense that the timberland may be made more valuable in some other market context—primarily residential or commercial real estate development. In these cases, land values will contribute more to total returns than is typical. The HBU potential for timberland may act as a longer term “call option,” for which investors may pay very little at the date of purchase.

### **Management Strategy**

A TIMO’s management strategy accounts for a small but substantial portion of timberland returns. There are many areas in which proper management can add significant value, including: a well-executed acquisition strategy; the implementation of leading-edge silvicultural techniques; proper region and age class diversification; and, an effective exit strategy. Additionally, a skillful TIMO will add value through managing the sale of its

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<sup>1</sup> Wear, David N., Douglas R. Carter, and Jeffrey Prestemon. “The U.S. South’s Timber Sector in 2005.” January, 2007.

timber. For example, a TIMO may assess the market for pine as temporarily depressed and exercise its right to store the trees “on the stump” until the market recovers.

### RETURN SOURCES

The above drivers of return are manifested in the two primary sources of timberland returns readily observable by investors: income and appreciation. Historically, appreciation has been the largest and most volatile component of total returns (see Figure 3). Because income returns are less volatile, timberland investors who favor a more bond-like return stream typically focus their timberland investment toward generating income. In general, timberland investment portfolios can be structured to meet different return-stream objectives.

#### **Income**

Timberland’s income component is driven almost entirely by the sale of harvested mature trees, though it may also include a small portion due to leases (e.g., from hunting and fishing), harvesting biomass (e.g., switchgrass), the periodic sale of development rights (e.g., for HBU), or carbon offsets or sequestration. Depending on how the timberland is planted, annual income returns should range from 3% to 7%. Achieving an income return towards the top of that range requires that the timberland be weighted toward more mature forests. Since timber growth and subsequent harvests are not affected by the movement of financial markets, timberland can be structured to act and behave in many respects like a relatively uncorrelated fixed income instrument.<sup>1</sup>

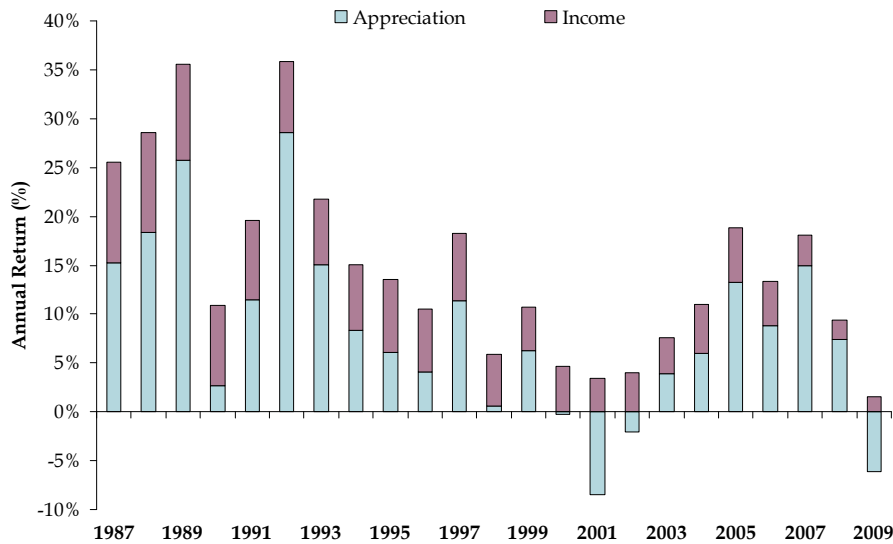
#### **Appreciation**

Capital gains to timberland stem from both (a) the increased volume and value of timber on a property and (b) the appreciation of the underlying land. Timberland valuations are based on discounted future cash flows, which themselves are based on projections on biological growth, cash flow, and interest rates. It is worth noting that timberland values have historically increased at a rate in excess of inflation.

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<sup>1</sup> Of course, the price of timber affects income and is impacted by the broader economic and capital market environment.

Figure 3. Timberland return components. Source: NCREIF



As with traditional real estate, an investor can calculate a “cap rate” for timberland by dividing a property’s net operating income by its market value. In general, purchasing at higher cap rates implies higher future returns for the buyer.

## RISKS

Besides the economically-driven fluctuation of timber prices and land values, there are several special risks to investing in timberland. Fortunately, timberland risks may be partially addressed by diversification and active silviculture management.

### Liquidity Risk and Valuation Uncertainty

The marketplace for timberland is “thin,” characterized by few buyers and sellers at any given time. This can lead to wide disparities among buyers’ and sellers’ prices for given timberland properties for sale, frustrating transactions. Furthermore, the sale of timberland is a complex transaction that can take many months to execute. All of these factors often result in substantial illiquidity for investors.<sup>1</sup> From an investor standpoint, liquidity risk can be somewhat mitigated by investing in timber REITs (discussed later) as opposed to private timber investments.

Another, subtler implication of low timberland liquidity is the prevalence of appraisal-based pricing (as opposed to the transaction-based pricing of stocks and bonds). The annual appraisal process, which compares a property to similar properties that have transacted, ensures that timberland values change gradually over time—in effect illiquidity *lessens* the

<sup>1</sup> Note that while positions in timberland may be difficult to exit quickly, timberland investments can be constructed to mitigate liquidity concerns (through a focus on stable income).

observed volatility.<sup>1</sup> This may be especially true during downturns, as fewer transactions tend to occur when sellers are unwilling to accept the new, lower price of buyers. However, when sales are executed, investors occasionally discover that carrying value was quite different from the realized sale price.

### **Physical Risk**

Timberland is subject to losses from natural and human-caused events such as fire, insect and vermin infestations, disease, inclement weather, and theft. Unsurprisingly, the degree of physical risk varies considerably by geographic region, as some areas are more prone to certain diseases, forest fires, etc. These risks can be largely mitigated through proper silviculture management (discussed later) or through insurance. Indeed, the industry estimates that historically only a small percentage of the total value of timberland has been lost to physical destruction.

### **Political and Regulatory Risk**

Political and regulatory risk can take a variety of forms. In the U.S., environmental concerns and changing government policies mean that enacted regulations (e.g., the Clean Water Act and Endangered Species Act) can serve to restrain or prohibit a number of timberland management activities, including the harvesting of certain timberlands. In international settings (especially developing markets), the main political and regulatory risks stem from possible regime instability, the threat of expropriation, and weak regard for property rights and the rule of law.

### **Leverage**

Leverage allows a timberland manager to purchase or develop more properties with the same amount of equity capital. The effect of this is an amplified positive or negative return on equity; that is, leverage increases volatility. Not only does leverage increase volatility during “normal” times, but in rare circumstances (i.e., a severe liquidity crisis) leverage could lead to an inability to refinance properties, and, ultimately to the “fire sale” of properties. In addition, the need to service the borrowing costs of leverage requires a minimum level of generated income. Fortunately, TIMOs typically apply minimal leverage (compared with other real estate investors) of under 35% to their portfolios.

## **MANAGING THE RISKS**

### **Diversification**

As in other asset classes, diversification in timberland investments is key to reducing risk. Recognizing this, TIMOs typically build portfolios of properties that are diversified by geography, size, species, age, and proximity to saw mills and transportation infrastructure. If one forest suffers a devastating disease, or one species falls out of favor with furniture makers, the impact on the broader investment portfolio can be limited. Of course, the ability

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<sup>1</sup> This leads to market cycles of timberland that lag economic cycles.

of a TIMO to diversify is sometimes limited, as it depends upon the characteristics of available timberland tracts.

### **Silviculture Management**

Active silviculture management has the potential to lessen both economically-driven and physical risks. Good silviculture management techniques include a certain nimbleness when directing logs toward the highest value markets.<sup>1</sup> For example, removing unhealthy trees or the less desirable species from a stand of trees allows the healthy or the more valuable trees room to grow faster, shortening the overall lead time for an appealing market. Proper silviculture management will likely also include introducing fire breaks and regular monitoring of the property for intruders, both human and non-human. The difference between poor silviculture management and good silviculture management may result in more than 5% in additional return per year.

### **BENCHMARKS**

Because of the complexity of valuing timber properties, there is only one commonly used benchmark, the NCREIF Timber Index (NTI). The NTI is an index of unleveraged core U.S. timberland returns as reported by timber fiduciaries (mostly TIMOs). However, properties within the NTI account for only 50% of the investable properties, and it was dominated by one major TIMO for the first two decades of its existence.<sup>2</sup> Furthermore, the NTI is not investable, nor does it account for management and operational fees. Lastly, the NTI is not constructed in a way that makes it directly comparable to most TIMO strategies (e.g., the NTI is unleveraged and most TIMOs employ some degree of leverage).

### **IMPLEMENTATION AND STRATEGIC ALLOCATION**

Plan sponsors may invest in timberland through both public and private investment vehicles, each of which exhibits different return characteristics. Public investment vehicles, including timberland REITs, are more likely to exhibit equity-like volatility and to be correlated with the stock market.<sup>3</sup> Private investment vehicles, on the other hand, are expected to exhibit lower *observed* volatility. Furthermore, investors should expect private equity funds to provide an additional return over similar public investments because of (1) an illiquidity premium and (2) higher potential returns. Finally, there are only three publicly traded timber REITs in the U.S., and only one derives the majority of its revenues from “traditional” timberland activities.<sup>4</sup> Higher achievable returns, a lower correlation, and

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<sup>1</sup> It should be noted that, as opposed to most TIMO operations, a majority of integrated forest products companies are not able to time the market. They own timberlands to supply their mills, which—because of high fixed costs—must be kept running even during depressed economic cycles.

<sup>2</sup> Hancock Timber managed over 50% of the properties in the index until 2002. Today, Hancock represents less than 25%.

<sup>3</sup> The historical correlation between a representative timber REIT (Plum Creek) and the Russell 3000 is 0.44.

<sup>4</sup> The three publicly traded timber REITs as of early 2010 were Plum Creek, Potlatch, and Rayonier. Weyerhaeuser had also announced their intention to switch to a REIT structure. Plum Creek is the only one of these to derive more than half its revenues from traditional timberland activities.

a broader opportunity set argue strongly for employing private market vehicles for a timber allocation.

Still, fully funding private investment vehicles may take years. As such, plan sponsors may wish to consider investing the balance of their target allocation to timberland in public investment vehicles. Though private timber funds display the characteristic “J-curve,” it is generally less pronounced than those most private equity investors are accustomed to. Nevertheless, plan sponsors investing in private vehicles will need procedures to accommodate capital calls and distributions reliably and efficiently.

### **Vehicle**

There are two categories of timberland investment vehicles: closed-end and open-end funds. Closed-end funds, which control the timing and amount of investor contributions and distributions, are the most common private vehicle. Open-end funds, which allow for periodic investor entry and exit with some liabilities, are more commonly found among public vehicles. Closed-end funds are valued infrequently, while open-end funds can be valued daily (e.g., timberland REITs). Most timberland investments are structured as closed-end private partnerships, generally with ten-year terms and two to three one-year extensions. They typically have an investment period of three to five years, and will usually invest in up to ten to fifteen assets.

Larger plan sponsors who are planning to make a sizable commitment (e.g., more than \$100 million) to timberland may also be able to access the asset class via a customized portfolio of directly-owned properties and to participate in co-investment opportunities.

### **Costs**

The fees on private partnerships are high, and generally include both a management fee of approximately 1.0% and a performance-based fee. The performance fee typically involves a “preferred return” and a “carried interest” of up to 20%. All of the costs and fees associated with timberland investing are higher than for public market securities and will be dilutive on returns.

### **Valuation**

A valuation of all properties is usually completed by TIMOs on a quarterly basis using data provided by independent sources. Projected volumes are adjusted to reflect growth as well as harvest removals. Current values are determined by applying third-party per-unit timber values to adjusted volumes. Timber that is too young to be harvested is valued via discounted cash flow analysis. Typically every three to five years an independent appraisal is completed on every property, which includes a detailed inventory of current timber volumes and estimates of biologic growth rates for all represented species. The appraiser determines the current fair market value of all assets including bare land, merchantable and non-merchantable timber, and possible higher and better use parcels.

**Timing**

Trying to time a market on a quarter-by-quarter basis is extremely difficult, and is therefore not recommended. Rather, a more “tactical” strategic approach is recommended, through setting target allocation ranges wide enough to allow for modest shifts relative to long-term targets. A plan sponsor who is concerned about an entry point might consider allocating assets to the space incrementally. In addition, if a particular sector appears temporarily unattractive, a more gradual approach to investment in that sector may be warranted.

**SUMMARY**

Timberland is a desirable asset class because of its potential portfolio benefits. First, timberland has historically generated impressive risk-adjusted returns with low correlation to other asset classes – providing valuable portfolio diversification. We generally expect this to continue, though we do not expect double-digit annual returns in the future. Second, timberland returns have responded comparatively well to consumer price inflation, thereby providing a modest inflation hedge.

However, an investment in timberland is not without risks or disadvantages, including illiquidity, the lack of an investable benchmark, and high costs. Despite these risks, Meketa Investment Group recommends that long-term investors allocate a percentage (10% to 40%) of their natural resource assets to timber. We believe that plan sponsors should focus on private market vehicles, gradually increasing their exposure by building a diversified portfolio.

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**GLOSSARY**

**Carried Interest:** The percentage of profits that the general partner (manager) of a private equity fund receives when the fund's assets are sold. The carried interest represents compensation, not a return on the general partner's own investment.

**Eucalyptus:** Long-fibered deciduous common in the Southern Hemisphere.

**Hardwood:** Hardwood trees are generally deciduous trees that typically lose their leaves in the fall or winter and dominate the Northern Hemisphere and northeastern and north central regions of the U.S.

**HBU:** Higher and Better Use for a timber property (rather than for harvesting timber alone).

**J-Curve:** Many private partnerships have small negative returns in their first years of operation as capital is invested. The negative returns results from immature investments that have not yet yielded a profit. When early deals begin to mature and are liquidated at a profit, the partnership's returns should become positive.

**Loblolly pine:** Fast-growing softwood common to southern climatic zones.

**Natural Forest:** Forests that established by nature. Natural forests typically have lower capital and maintenance costs than plantations.

**Plantations:** forests that are established by planting. These forests generally have higher input and maintenance costs, but much higher productivity than natural forests.

**Preferred Return:** The minimum rate of return (as a percentage) that a limited partner of a private equity fund must receive before the general partner can begin to receive carried interest.

**Productivity:** a measure of a forestland's ability to grow trees. Productivity is improved through the application of silviculture practices, including planting genetically improved seedlings, fertilization, thinning and weed and brush control.

**Pulpwood:** Long-fibered conifer common to temperate climatic zones. They are the least valued type of timber.

**Rotation:** Typical "life cycle" of a tree from plantation to harvesting.

**Saw timber:** Timber (typically softwoods) that is directed toward construction markets. Saw timber is the most valued type of timber.

**Sawlog:** A log with average circumference in excess of twelve inches.

**Silviculture:** the art and science of growing and harvesting timber and includes four interrelated disciplines: (1) inventory analysis; (2) stand level management; (3) economic and financial analysis; and (4) harvest scheduling.

**Softwood:** Softwood trees are needle-bearing conifers (also known as evergreens) such as pines, spruces, firs, and junipers. Softwoods are dominant in the western and southern regions of the U.S.

**Stumpage:** Refers to the specific log that is to be sold on a particular timber stand.

**Timber REITs:** Timber Real Estate Investment Trusts are publicly traded equity ownership of timber assets. Timber REITs are not subject to entity-level taxes as long as they remain a qualified real-estate investment trust.

**TIMO:** Timberland Investment Management Organizations. TIMOs are entities that invest capital on behalf of a range of investors, including individuals, state and corporate pension funds, endowments, and foundations.