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TIR

CAPITAL PLACEMENT IN TIMBERLAND

Considerations in Temporal Diversification and Market Timing

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Introduction

When investors choose to add timberland to their portfolios, the most vexing question many face is deciding on the allocation. After that issue has been addressed, the focus often shifts to selecting the investment vehicle (e.g., commingled fund, separate account, fund of funds) and then the manager.

However, one consideration that is frequently overlooked during this process is how to put one's capital to work most effectively. Some institutional investors choose a measured approach, placing funds into the asset class over extended periods of time. Others strive to invest their committed capital as soon as possible. Finally, there are investors who believe they can capture an advantage by timing the market cycle and placing capital at the most advantageous time given their risk and return objectives.

This white paper briefly examines three issues:

1. The benefits associated with vintage-year diversification

2. The drawbacks associated with market timing

3. The importance of manager selection in the capital placement process

TIR's summary of conclusions is as follows

- Placing capital into the market over a period of time, rather than investing it all at once, can help significantly reduce risk within a timberland investment portfolio. In fact, TIR's analysis shows that "temporal diversification" may reduce overall volatility by a factor of 10 to 20 percent.

- Temporal diversification is particularly impactful for risk averse investors and can be employed to augment other risk-reducing diversification strategies, such as gaining exposure to different geographies, end-use markets, tree species and forest maturities.

- For investors with a higher tolerance to risk, the rapid and concentrated deployment of capital that typically characterizes market timing may produce returns that diverge from the performance of the timberland asset class, in general.

- The higher level of risk the market timing approach entails is typically a result of two factors – less than optimal asset selectivity and exposure to a

narrower set of investment conditions, including asset and timber pricing trends.

- Finally, the choice of investment manager is an important consideration in the capital allocation equation because a manager's strategy, style and approach may influence the degree to which it favors a rapid or patient deployment of capital as well as the nature and scope of the assets that are likely to be acquired. For instance, a timberland investment manager (TIMO) that is focused on selectively finding the right forest asset to unlock unique market inefficiencies or target niche markets will take longer to build out a portfolio. Such portfolios would naturally benefit from temporal diversification. .

This analysis begins with a brief case study.

A Cautionary Tale

The sub-par timberland investment performance that one of the world's largest pension funds produced during the period between 2007 and 2015 is, perhaps, an excellent example of why the timing of one's capital allocation can be consequential.

This state retirement system, which had more than $300 billion in assets under management in 2015, was among the first institutional investors to participate in the timberland asset class. Between 1989 and the early 2000s, it built and then liquidated a geographically diversified portfolio that consisted of more than 1.5 million acres of timberland valued at nearly $1.75 billion. In 2007, however, it re-entered the timberland investment market and acquired a majority interest in the forest holdings of a large, integrated forest-products company. This transaction, which was facilitated by a well-known timberland investment management organization (TIMO), resulted in a $2.38 billion acquisition of 1.5 million acres of forestland in the U.S. South. Unfortunately, and despite the state pension fund's considerable experience with the timberland asset class, this new portfolio produced a five-year, composite performance (through 2015 Q1) of -0.4 percent, which was 660 basis points lower than the 6.2 percent return generated during the same period by the NCREIF Timberland Property Index.

While other factors clearly contributed to this trailing performance, a strong argument can be made that the institutional investor would have performed better against the NCREIF benchmark if it had metered its $2.4 billion allocation into the market over a four-to-five-year period rather than making a lump-sum commitment during a time when timberland asset valuations were widely considered to be richly-valued. The following market correction in 2009 through

2011 which saw average timberland prices in the U.S. South falling more than 20 percent from its peak proved out those concerns.

The remainder of this white paper explores this issue of "temporal diversification," as well as closely related questions, including the benefits and drawbacks of market timing and how manager selection can influence the effectiveness and efficiency of one's capital allocation.

Effect of Rapid vs. Extended Capital Placement on Risk

Some investors choose to build their timberland portfolios over short time frames. Their reasoning is that it is best to put available capital to work as quickly as possible so the asset-allocation target for the entire portfolio can be reached. However, a counter argument can be made that extending the capital placement period over time can help reduce portfolio-level risk. *Temporal Diversification* – or vintage-year diversification – can offer risk-adjusted performance benefits that are similar to those generated by geographic, market, end-use product, tree species and forest maturity diversification.

To assess this benefit, TIR used the 28-year history of the NCREIF Timberland Property Index as a proxy for a hypothetical timberland portfolio. That portfolio was then analyzed to determine how it would have performed if its capital had been fully allocated over both a one-year period and a four-year period. The results of this comparison are shown in Table 1 below.

Table 1. *Total annualized return and standard deviation of hypothetical 10-year timberland portfolio that tracked the NCREIF Timberland Property Index, assuming all allocated capital was invested over a one-year period (4 quarters) and over a four-year period (16 quarters).*

Investment Period	Average Return	Risk (Standard Deviation)	Sharpe Ratio
1 Year (4 quarters)	**10.92%**	**4.69%**	**2.19**
4 Years (16 quarters)	10.49%	3.88%	2.53

* Sharpe ratio assumes a risk free rate of the spot yield of 0.670% for 2-Year U.S. Treasuries as of July 28, 2015. A higher Sharpe Ratio indicates a better risk-adjusted return.

While the average return for this portfolio was slightly higher when all of its capital was invested in a single year − 10.92 percent compared to 10.49 percent − the tradeoff was a significantly higher level of risk. When the portfolio's capital was invested over a four-year period, its standard deviation was 3.88 percent compared

Methodology

The analysis was performed by taking a given quarter from the NCREIF Timberland Property Index's history and assuming a timber portfolio was built out either (a) rapidly over one year / 4 quarters; or (b) gradually over four years / 16 quarters. Spreading the capital allocation over at least four quarters reflects the relatively irregular, illiquid nature of the timberland market. Normally, it can take several quarters to construct a timberland portfolio that has committed capital of $50 million. Returns for both types of portfolios were assumed to match that of the NCREIF Timberland Index over a 10-year period.

For more details on the methodology employed, please, see the Appendix.

to 4.69 percent. This difference means the risk level of the portfolio was 17 percent lower when its capital was invested over 16 quarters as opposed to four quarters. Furthermore, the Sharpe Ratio, which is a measure of risk-adjusted investment performance, was 16 percent higher for the portfolio constructed over a period of years.

This analysis suggests that risk-averse investors, in particular, may benefit from spreading their investments in timberland out over a number of years because such an approach can increase the likelihood that poor performance in some years might be offset by better performance in others. In fact, TIR's work indicates that such an approach could reduce portfolio risk by roughly one-sixth.

Practical Considerations of Market Timing vs. Selective Investments

Some investors that choose to overlook the benefits of temporal diversification do so under the conviction that they can achieve better performance by timing the market. Market timing refers to a broad entry into, or exit from, an asset class based on interpretations of certain market cues or indicators − the expectation being that such interpretations will lead to buy or sell decisions that will produce superior investment performance.

While market timing can be effective in the timberland asset class, institutional investors must be aware of its limitations and risks, which are outlined below.

Variability as a Challenge for Market Timing

Even if a market timing strategy is successfully executed, it still may not produce returns that mirror or exceed those of the market because timberland markets are not homogenous. Timberland investment regions and properties are typically characterized by a great deal of variability. These difference are what make the market inefficient. They also are what make it difficult to build a portfolio with an optimal mix of assets using a market timing strategy because one or two very strong or very weak acquisitions can easily make or break a portfolio's

performance. In other words, an investor may time the market right only to see that analysis and judgment negated or offset by the weak selection of forest assets or the hiring of an investment manager that has a style, strategy and approach that is a poor fit for the circumstances under which the capital is to be placed. To demonstrate the impact of this variability, Figure 1 below shows the differences in gross annual returns for timberland funds and accounts performing in the upper (75th percentile) and lower quartiles (25th percentile). It illustrates that for portfolios with five years and 10 years of history, the investment performance range averaged more than 400 basis points, which was a considerable difference for funds and accounts that share a common time frame.

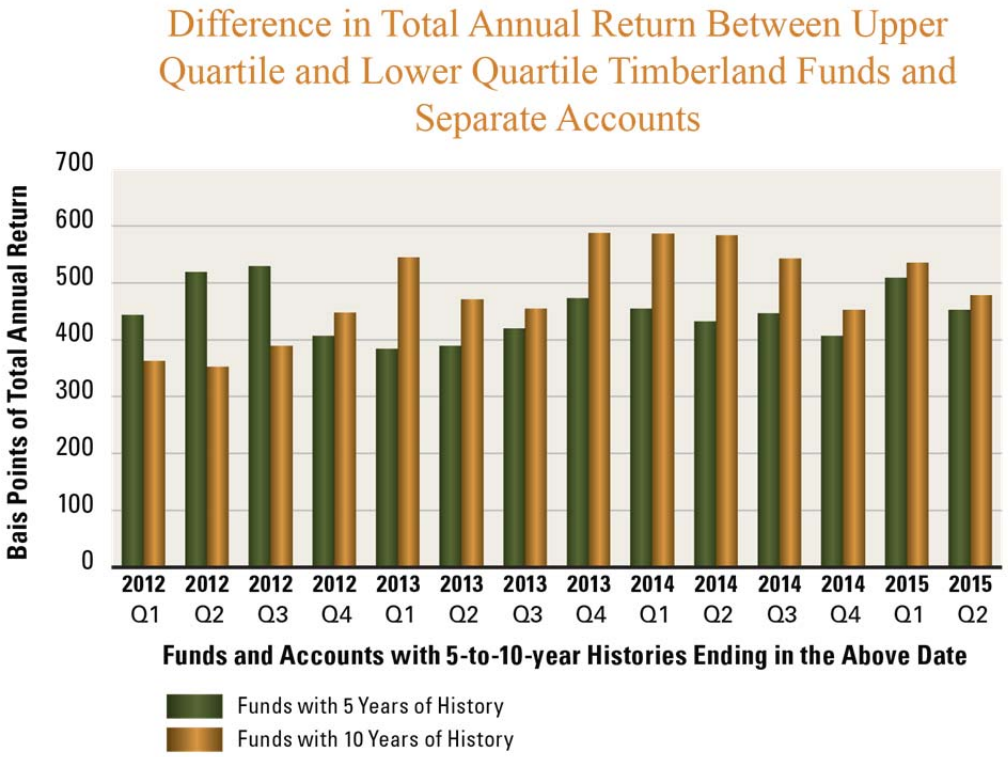

Figure 1. The difference in total annual return between upper quartile (75th percentile) and lower quartile (25th percentile) funds and separate accounts in the United States over a five–year and 10-year period, as tracked by the NCREIF Timberland Fund and Separate Account Index.

Interestingly, this disparity in performance across timberland portfolios is sustained over both the five-year and ten-year measurement periods, suggesting that there is little convergence in performance over time.

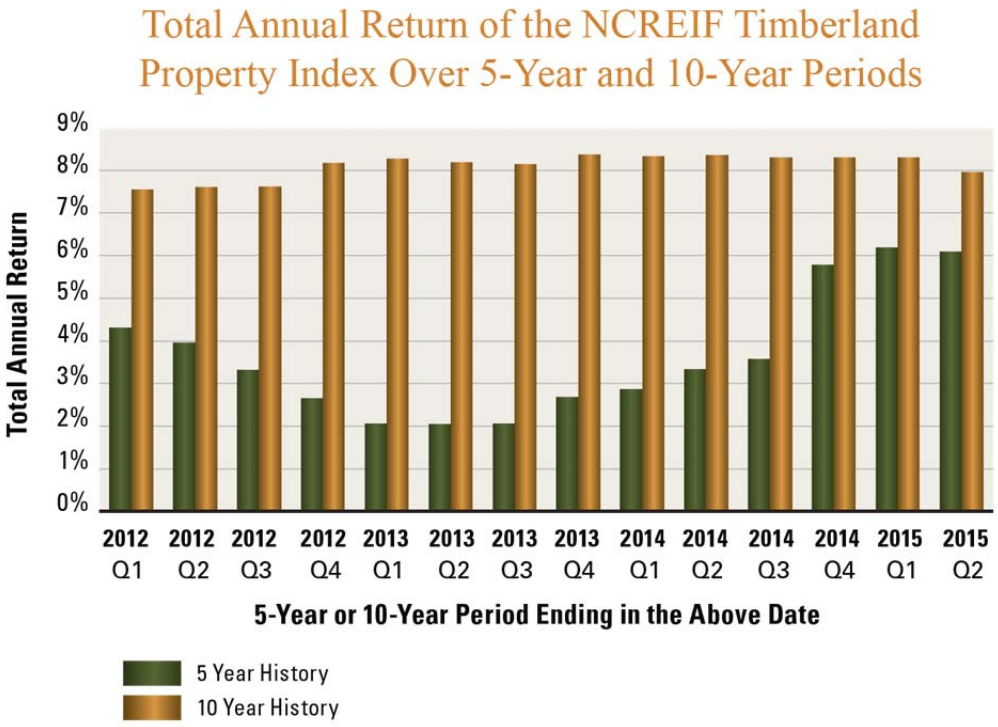

Figure 2. The total annual return of institutional timberland investment in the United States over a 5-year and 10-year period, as measured by the NCREIF Timberland Property Index.

The chart in Figure 2 compares these findings against the timberland asset class as a whole. It shows the total annual return of the NCREIF Timberland Property Index over five-year and 10-year time intervals as of a series of quarterly ending dates between 2012 and 2015. The best five-year return over that time was 6.28 percent. The worst was 2.05 percent. The execution of a market timing strategy that successfully replicated the NCREIF Timberland Property Index's performance could result in a positive difference of 423 basis points. However, when the analysis was extended over a ten-year period, the difference between the best and worst returns (Q1 2012 and Q2 2015) was a mere 82 basis points. This convergence clearly indicates that market timing may offer less benefit over longer periods of time.

This analysis also suggests that the choice of investment vehicle or manager can have as much of an impact on an investor's performance over a five-year period as can that investor's successful implementation of a market timing strategy.

However, it also indicates that over a longer span of time – 10 years, for instance – the vehicle and manager an investor chooses may have a greater impact.

Temporal Diversification as a Counterpoint to Market Timing

The issue with market timing – or any other investment strategy that seeks to place significant capital into the timberland asset space in a short period of time – is that it can compromise one's investment selectivity. Timberland markets are sporadic and irregular, with relatively low turnover. Even in the United States, which has the deepest and most active timberland investment market in the world, the total value of large timberland transactions completed in a single year has never exceeded $9 billion (Figure 3). In fact, annual, domestic transaction volume is typically in the range of $2 billion to $5 billion. Timberland markets in other countries are even smaller, with average transaction values rarely reaching more than a half a billion U.S. dollars. As a result, if the goal is to place a large amount of capital into the timberland market, and to do so quickly, investors usually have fewer options and need to be less selective about the assets they ultimately acquire. This, in turn, can have consequences – and specifically result in the creation of an unbalanced and poorly diversified portfolio.

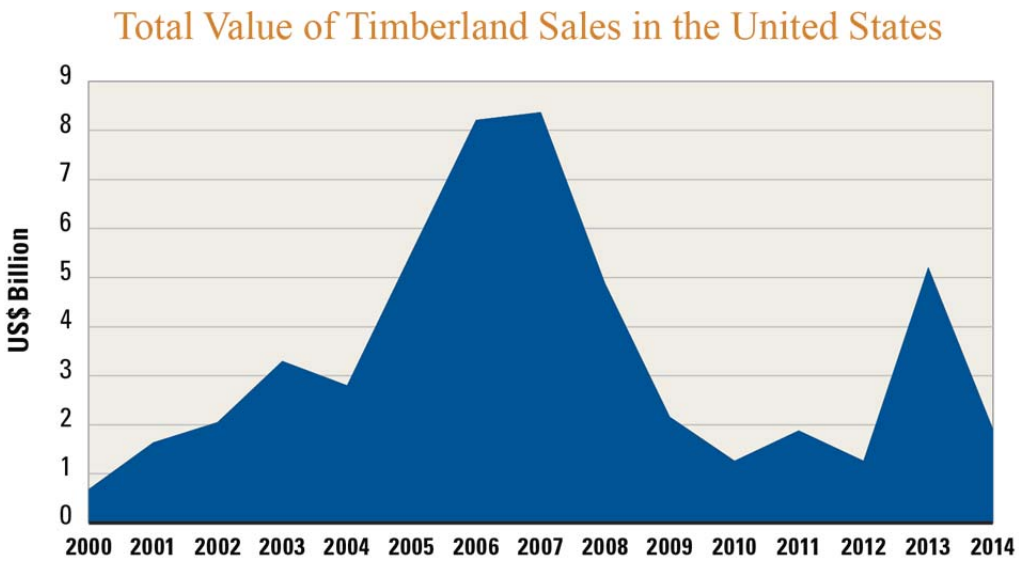

Figure 3. Total transaction value of large timberland in the United States from 2000 to 2014.

Source: Timber Mart-South

Temporal diversification is the counterpoint to market timing. If investment returns of a given vintage year can diverge widely from the overall market, it stands

to reason that placing capital over a longer period of time can help lower overall portfolio risk.

Taken in a larger context, vintage-year diversification is one tool among many investors can use to manage timberland investment risk. Diversifying just across geography, for example, can measurably reduce a portfolio's risk exposure. Evidence of the positive effect of this diversification can be found in Figure 4 below, which shows the correlation of annual timberland returns among the four major timber-producing regions of the United States. It illustrates that returns for the U.S. South, Northwest, Northeast and the Lake States, all fall below 0.50, which means they are weakly correlated.

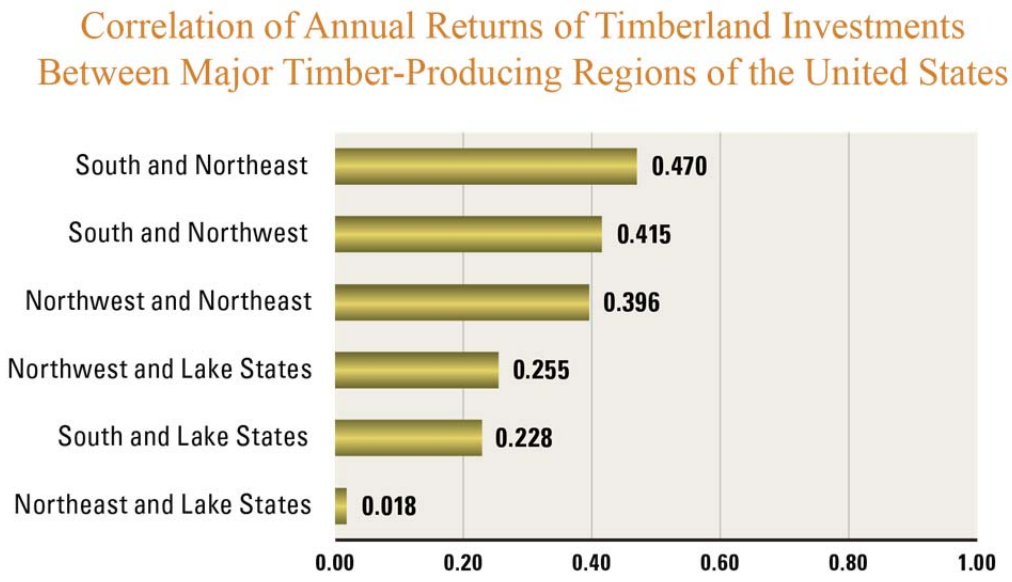

Figure 4. The statistical correlation of annual total gross return (before manager fees) of timberland investments among the four major timber-producing regions of the United States. A correlation value of 0 indicates no relationship while a value of 1 indicates returns that move in perfect tandem. Returns are reported by the NCREIF Timberland Property Index from 2014 back through 1987 for the U.S. South and Northwest, through 1994 for the U.S. Northeast, through 2007 for the U.S. Lake States.

Unfortunately, the use of a market timing strategy can make it difficult for an investor to take advantage of these benefits because it can result in the creation of a geographically unbalanced portfolio – one that is too heavily weighted in one or more regions.

Other Consideration for Market Timing is Manager Selection

Regardless of the capital placement strategy being employed, selecting the right manager to execute a market timing strategy is crucial. Timberland investors that

have the best track records with market timing are those that either (a) have developed a very strong internal expertise in forestry and forest markets, or (b) have relied on TIMOs that are well equipped to execute that strategy. On the other hand, institutional investors that have underperformed when using market timing to allocate capital either (a) have lacked in-house proficiency in timberland investing, or (b) have selected managers with the wrong skill sets and capabilities to implement their specific strategies.

As was mentioned previously, timberland is a complex asset class. It is possible to generate alpha at any point in the market cycle by identifying and capitalizing on market inefficiencies, but a TIMO must have the requisite skills to do so on behalf of its clients. Some managers, for instance, specialize in acquiring and managing timberland assets that have strong conservation values that can be captured through the sale of easements and ecosystem services or by employing mitigation banking strategies. Other managers have specialized skills that enable them to enhance the value of timberland assets for purposes other than timber production so their investors can benefit from higher and better use (HBU) land values. Still others invest heavily in state-of-the-art biometrics, tree genetics and silvicultural science, which enable them to significantly improve timber growth rates on their clients' lands. Investment managers with such specialties are well-suited to helping their clients select timberland assets that will make the best use of their unique capabilities so they can produce strong performance across market conditions.

Conclusions and Recommendations

TIR's analysis suggests that making forest investments over time is one way to help reduce timberland portfolio risk. In fact, temporal diversification can, by one measure, reduce the volatility of a portfolio by roughly 10 to 20 percent. Furthermore, temporal diversification can be used to supplement other forms of portfolio diversification, such as investing in a range of species, different forest maturities and varying markets and geographies.

How suitable temporal diversification is for a particular investor depends on that investor's risk tolerance, capital availability and cash flow requirements. A risk-tolerant investor that wishes to maximize returns may not find vintage year diversification as beneficial as one that has a more conservative outlook.

If temporal diversification is not important to an investor, market timing may be a suitable alternative. However, it is important for investors to understand that even if a market timing strategy is successfully employed, it may not produce performance that is better than, or comparable to, the market at large. Market timing – or any other investment strategy that entails the rapid deployment of capital, can entail higher levels of risk. Constructing a timberland portfolio quickly

also can mean that an investor's capacity to benefit from asset selectivity can be compromised.

Finally, investors that take a slower and more deliberate approach to distributing capital and building a timberland portfolio can be more selective about the assets they acquire. In addition, doing this with the assistance of an investment manager that has a style, strategy and approach that fits the investor's overarching investment goals can be highly beneficial because it can result in the construction of a more balanced portfolio and one that is better positioned to produce alpha by identifying and unlocking unique inefficiencies.

Appendix: Methodology to Compare Rapid vs. Extended Capital Placement

Using the NCREIF Timberland Property Index as a source of timberland investment performance, two different hypothetical portfolios with $200 million in capital allocation were constructed: (1) capital is placed within one year (4 quarters); (2) capital is placed across four years (16 quarters). Total life-of-investment returns were calculated over 10 years, assuming these portfolios tracked that of the NCREIF Timberland Property Index. The process is as follows:

Rapid (1-year) Capital Placement

1. A given quarter in the history NCREIF Timberland Property Index from 1978 Q1 through 2015 Q2 is chosen.
2. Timberland investments totaling $50 million is made in that chosen quarter. An additional $50 million is invested for each of the three subsequent quarters. That will total $200 million of capital placed over a 1-year, 4-quarter period.
3. Return of the timberland portfolio is added in each consecutive quarter, matching what was reported by the NCREIF Timberland Property Index, up through 10 years. For example, if the investments began in 2002 Q2, the termination of the portfolio was 2012 Q2.
4. The internal rate of return (IRR) was calculated based on the investments and returns over that 10-year period.

Extended Capital Placement

1. A given quarter in the history NCREIF Timberland Property Index from 1978 Q1 through 2015 Q2 is chosen.
2. Timberland investments totaling $12.5 million is made in that chosen quarter. An additional $12.5 million is invested for each of the 15 subsequent quarters. That will total $200 million of capital placed over a 4-year, 16-quarter, period.
3. Return of the timberland portfolio is added in each consecutive quarter, matching what was reported by the NCREIF Timberland Property Index.
4. Investments made in the 1st year (first 4 quarters) conclude at 10 years after the first investment. For example, if the investments began in 2002 Q2, the termination of the first $50 million of investment made from 2002 Q2 through 2003 Q1 ended on 2012 Q2.
5. Investments made in the 2nd, 3rd, and 4th years are calculated the same way as the 1st year.
6. The internal rate of return (IRR) was calculated based on the investments and returns over that 14-year period.

Note: The $200 million portfolio is an arbitrary value. Any value will work. The portfolio IRR is not affected by the size of the capital allocation.

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