# C I N T R A F O R

## Working Paper 36

Back to Publications List

# Wood vs Non-Wood Materials in US Residential Construction: Some Energy-Related International Implications

**Peter Koch. 1991**

## Executive Summary

Timber harvest reductions in the Northwest intended to preserve the northern spotted owl and to further other non-timber management objectives will significantly reduce the region's output of structural wood products. Same of the demand for these products will be supplied from timber grown elsewhere in the world, but this supply will be limited by economics and by preservation movements pervasive globally. Major substitution of nonrenewable structural materials such as steel, aluminum, concrete, brick and plastics to replace the shortfall in structural wood products can therefore be expected. Because these nonrenewable structural materials require more energy to extract and manufacture than their wood counterparts, global consumption of fossil fuels and concomitant additions of $C0_2$ to the atmosphere will be significantly increased. while the magnitude of reductions in Northwest timber harvest remain uncertain, estimates can be made of resultant increases in energy consumption and $C0_2$ additions based on a range of harvest reduction scenarios.

Federal forest plans will reduce timber harvest by 1.45 billion board feet from the average harvest levels observed in the 1983 to 1987 base period. Assuming 100% substitution of these wood products by nonrenewable structural materials, the reduction in timber harvests would increase oil consumption by 24.9 million barrels annually. This increase in oil consumption would release 10.9 million tons of carbon dioxide into the atmosphere. A federal conservation strategy for late-successional old growth (LS/OG) forests to maximize the probability of spotted owl preservation would reduce harvest by 4.45 billion board feet increase oil consumption by 80.1 million barrels, and release 35.1 million tons of $C0_2$ Into the atmosphere. Under the most restrictive scenario, in which the Interagency scientific Committee (ISO) strategy to preserve the owl is extended to state and private lands, timber harvest would decline by 8.25 billion board feet, oil consumption could increase by 140.8 million barrels, and an additional 61.6 million tons of carbon dioxide would be released into the atmosphere.

This extreme case of full implementation of the ISO strategy on public and private land could result in an additional fuel oil consumption equal to about 70 days' output of the Alaska pipeline operating at capacity. Annually, the Alaskan pipeline presently supplies about one-quarter of the nation's oil requirements. For further perspective, an annual increase in world oil consumption of 140.8 million barrels is about equal to 117 cargoes of tankers the size of the Exxon Valdez, enough to operate a fleet of 11 million automobiles. This increase in world oil consumption and 002 additions to the atmosphere are best viewed as upper bounds for two reasons. First, the projections are based on energy data from the 1976 Report of the Committee on Renewable Resources for Industrial Materials (CORRIM). While the energy data in this CORRIM Report were accurate for 1976, recycling and other measures taken since 1976 by the steel and aluminum industries have lowered energy requirements for these materials. The CORRIM Report should now be updated to reflect these changes as well as similar improvements in the cement, masonry, plastics, and wood products industries. Second, all of the harvest loss in the “owl" region will not be replaced by renewables. That is, some additional wood will be imported with related environmental impacts in these alternate supply regions.

Concern about the environment, which fuels much of the passion in the argument over harvest level, often appears to be focused on local and regional issues, not on global effects. Regardless of the uncertainty in assumptions involving the degree of product substitution and those harvest reduction, is abundantly clear that there are substantial environmental consequences beyond the preservation of local forestland.

It is an anomaly that a significant segment of the population of the United States-professional foresters as well as lay public-considers it economically practical, and environmentally ethical, to:

* forego tree plantations on some of the highest quality sites in the United States, while accepting the strategy of purchasing more expensive wood from foreign forests (mostly plantations of introduced pines) even though their lower productivity will result in average of habitat lost outside the US exceeding acreage preserved inside the US; or
* accept substitution of more costly nonrenewable materials, largely imported, at the expense of significantly greater global energy consumption, fossil fuel depletion, carbon dioxide additions to atmosphere, and nonrenewable materials depletion.

Logic suggests that the various publics of the United States will ultimately apprehend that substantial harvest reductions to alleviate some perceived local environmental problems within our most productive forests will likely create significantly greater environmental problems around the globe.

It would seem more reasonable to intensify management of the resources provided by forests and to resist any significant diminution of acreage committed to multiple-use forests. Also, research efforts should be intensified to increase the percentage of each harvested tree's volume converted into structural products and to prolong the longevity of wood in service-thereby maximizing carbon capture and minimizing $C0_2$ additions to atmosphere.

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**Back to Publications List**