

Industrial Ecology and Sustainable Forestry

A response by Kenneth E. Skog and Peter J. Ince

The approach taken by Wernick et al. (p. 8) to assess the most effective ways to conserve forests and their benefits is useful but limited. It highlights key influences on harvesting—where decreasing harvest area is taken as proxy for increasing conservation of forests and increasing forest benefits. But such a focus ignores other critical environmental objectives that guide forest management.

The approach—tracing the flow of materials through production and consumption—is useful as a way to organize a discussion about how major economic groups act in concert to determine how much forest is harvested each year. Consumers, forest products producers, and forest owners (with or without the aid of foresters)—acting in their economic interest in the marketplace (within regulatory constraints) or, in the case of governments, guided by policy, regulation, and public influence—cause changes in consumption, production, supply of wood, and acres harvested.

The approach by Wernick et al. is useful to clarify trends and raise questions not only about ways to conserve wood but also about ways that increased wood use may serve environmental and economic ends. Here is a discussion of key trends using the approach. Total roundwood use per deflated dollar of GDP (IOU) dropped 2.5 percent per year during the 20th century. The causes of the drop changed from the first half of the century to the second half. Much of the drop in IOU from 1900 to 1949 was caused by a shift from fuelwood use to industrial products use. Fuelwood as a fraction of total roundwood fell from 40 percent in 1900 to 20 percent in 1950 and 13 percent in 1998. As the fuelwood share of roundwood use declines, the trend in industrial roundwood use becomes more important. If we focus just on industrial roundwood, the IOU decline slowed from 2.8 percent per year between 1900 and 1949 to 2.1 percent per year between 1950 and 1998. The importance of wood in the economy is not falling as fast in more recent years. In fact, the decline in IOU since 1980 has slowed to 1.6 percent per year. The trend is even more pronounced if we look at IOU of products rather than the roundwood used to make them. IOU of wood and paper products fell at the rate of 2.5 percent per year between 1900 and 1949, 1.5 percent per year between 1950 and 1998, and only 0.6 percent per year since 1980. It would appear that economic forces are slowing the decline in importance of wood and wood products as a resource for our economy. The reason

the IOU of products declined only 1.5 percent since 1950 while IOU of industrial roundwood declined 2.1 percent is that we produced 30 percent more product from a unit of roundwood in 1998 than we did in 1950—the result of important developments in technology and resource use (greater use of residue, paper recycling, and more efficient panel and lumber production).

Not only does the approach by Wernick et al. call attention to ways we could hold down the amount and area harvested with improvements in forest science and management or technology improvement in harvest, production, and consumption. It also calls attention to the need to understand why and how the trend in wood importance in the economy is changing.

Environmental concerns may warrant greater wood production and use—and acres harvested. Four such concerns are growth and use of wood to store carbon, growth and use of wood for fuel to offset fossil carbon emissions, thinning of overcrowded stands to reduce fire risk, and use of wood rather than nonwood products to avoid greater adverse environmental impacts.

Given concerns for both holding down harvest and possibly increasing wood use to meet environmental concerns, we need a broader framework to clarify environmental objectives that involve forests and to suggest guides for sustainable management of forest ecosystems. By focusing on acres harvested, the approach by Wernick et al. does not recognize maintaining or modifying diverse measures associated with forest sustainability, such as those suggested by the Montreal criteria and indicators of forest sustainability—measures that cover diversity, productive capacity, ecosystem health, water resources, carbon storage, and socioeconomic benefits.

Data Sources

INCE, P.J. 2000. *Industrial wood productivity in the United States, 1900–1998*. Research Note FPL-RN-0272. Madison, WI: USDA Forest Products Laboratory.

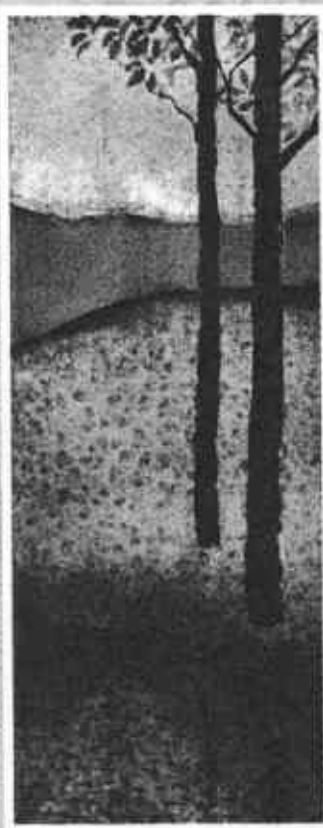
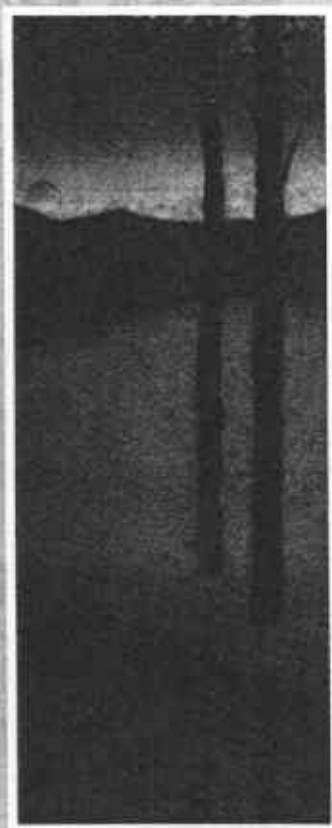
USDA FOREST SERVICE. 1997. *Report of the United States on the criteria and indicators for the sustainable management of temperate and boreal forests*. Available online at www.fs.fed.us/global/pub/links/report/candi.htm.

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Journal of
FORESTRY

October 2000

Volume 98, Number 10



**A Consumption Ethic
Industrial Ecology
Restoration**