

Chapter 1

Introduction

The steadily increasing drain on natural resources has promoted to an extraordinary degree the complexity of our industrial and social life. This unexampled development has had a determining effect upon the character and opinions of our people.

Theodore Roosevelt, 1908

Purpose

This report is intended to present factual, nonbiased information concerning the current social and political climate in which the forest products industry must operate. Examining the general public's contemporary attitude towards American forests and their stewards is crucial to effective forest management and responsible marketing of the forest products that consumers demand. It is consumers themselves who will dictate which forestry practices and forest products companies flourish and who are ultimately responsible for the sustainability or ultimate demise of forest resources. The American population has varied perceptions of the forest products industry; though some are correct, misconceptions about the forest products industry abound. The industry must take steps to alleviate distortions of the truth in order to remain competitive in the ever increasing environmentally-conscious marketplace and subjugate the inroads that steel and plastic are making into market segments traditionally dominated by wood.

Justification

This paper was prepared using secondary research from a wide variety of current academic and popular culture sources. Academic and legal journals, popular magazines, trade organization web sites, and industry periodicals provided the source for most of the information presented below. An enhanced version of an existing questionnaire was used to survey the perceptions of Virginia Tech students to validate the consistency of previous academic studies of attitudes towards forest products and natural resources.

Though created in an academic environment, this report has two secondary audiences: the general public and forest products professionals. Members of the public

are often ill-informed about subjects which are outside the realm of their personal interests and professional endeavors. They often rely on mainstream media sources to learn about subject matters in which they are not personally interested or professionally involved. The public needs to realize that, no matter their industry or area of interest, what they see and hear from mainstream media sources is not always correct, factual, or unbiased. What the public hears from environmental groups and competitors of the forest products industry is an even more distorted version of the truth.

Forest products professionals from university professors to corporate marketing executives to retail lumber yard personnel need to understand the perceptions that members of the general public have for wood, forests, natural resources, and the environment. They need to understand the social climate in which they pursue their career objectives and be prepared to handle tough, sometimes obscure issues from customers and end users of wood. Forest products professionals likewise need to understand that their target market, whether it be students, primary manufacturers, or end users of wood, are not always enamoured with the idea of using wood. Market place members may not fully realize the benefits of wood or detriments of using non-wood substitutes; forest products professionals, therefore, need to prepare themselves for the preconceived notions customers may have about wood and be able to convey to them the realities of wood.

Jim Bowyer, professor and department head of Wood and Paper Science at the University of Minnesota, has conducted several formal and informal surveys about wood, forest products, and the state of the environment among his students, forest products industry professionals, and the general public. The results are both shocking and dismal.

Bowyer succinctly sums the need to debunk public myths about wood: “I am led to wonder whether it is possible to have a rational discussion about forests and their management with someone who believes that trees will live forever if not cut down” (Bowyer 1995).

Chapter 2

Perceptions of the Forest Products Industry

Literature Review

Mainstream Media Studies

There are few surveys conducted by mainstream media sources (newspapers, magazines, and public polling firms) that focus strictly on forest products or forest management. Most focus on consumer attitudes towards the environment in general. Roughly half of the public say they are concerned about deforestation, but polls do not define deforestation, nor do they specify to which region of the world they are referring. Most surveys focus on broad issues such as global warming, ozone layer depletion, and ecology in general rather than specific questions about wood, paper, and recycling.

A 1994 survey discovered that only 36% of respondents feel that forest products companies are responsible stewards of America's forests. The Forest Service and environmental organizations scored 74% and 64%, respectively. Most Americans (52%) favor managing forests rather than letting nature take its course (40%) or letting forest fires burn themselves out (36%). Contrary to what most environmental groups want, an overwhelming majority (74%) support giving the Forest Service more management flexibility versus those who favor even more stringent regulation by Congress (17%). Roughly an equal percentage of respondents supported logging on national forests (47%) as those that opposed federal timber harvests (44%) (Smith and Clark 1994). Survey results indicate that Americans do not object to sensible forest management, though they hold the forest products industry, not the Forest Service, in low regard.

Public Agenda is a nonpartisan, nonprofit public opinion research and citizen education organization based in New York City. Public Agenda's mission is to "help leaders better understand the public's point of view on major policy issues and help

citizens better understand critical policy issues so they can make their own more informed and thoughtful decisions.” Their research shows that the major concerns of the public concerning the environment are:

- 1) the environment is getting worse and protecting it should be a top priority,
- 2) the feeling that there is a lack of environmental concern in this decade, and
- 3) the pollution problem is not under control and will get worse.

(Public Agenda Online 1999)

When asked what concerns them the most, respondents listed world overpopulation and destruction of the rainforest, followed by destruction of natural habitats and using up natural resources such as gas, coal, and oil.

A 1992 Consumer Reports survey asked readers 16 questions to gauge their opinion about cars, having kids, recycling, and the environment in general. Only two questions focused specifically on wood or paper. Respondents could not correctly identify what component of trash filled the most space in American landfills. The report said that paper is the single largest constituent of solid waste in municipal dumps in America, taking up 32% of landfill space. When posed with the question, “which of the following steps is an effective way to help save tropical rainforests,” 29% of respondents chose “recycling paper” while 31% correctly chose “none of the above” (Consumer Reports 1992).

To their credit, Consumer Reports, which has always been a conservative publication and takes measures to ensure that it remains unbiased, informed readers that:

Virtually no paper comes from the logging of ancient, irreplaceable forests. The destruction of tropical rainforests is being driven by overwhelming forces that, despite our best intentions, are largely unaffected by choices that consumers make in this country. (Consumer Reports 1992)

Consumer Reports acknowledges that the media plays a large part in forming public attitudes about the environment. Issues that receive the most “amount of publicity” are the ones that stay in the consumers’ mind. When asked what is America’s worst environmental health hazard, 51% of respondents said “toxic waste dumps” and 21% said “pesticide residue.” Consumer Reports attributes the public’s inability to identify the worst public health hazard in America (radon gas) to the media’s emphasis on reporting only the most visual environmental issues (Consumer Reports 1992).

The Futurist, an architectural magazine that focuses on environmentally sustainable building materials and techniques, conducted a public opinion poll of its own in 1995. Results showed that there are major concerns among the public about the health and sustainability of the environment. Nearly half of the respondents (48%) said a worldwide “eco-catastrophe” is possible in the next century; 39% believe current environmental fears are *not* exaggerated, and 37% are *not* optimistic that current efforts will preserve the natural environment. The survey allowed respondents to include their own comments. Two of the most interesting comments were:

- The ‘doomsday prediction’ is the catalyst for discovery or redirection of efforts; as a result of these efforts, the predictions of doom are rendered erroneous.
- Several examples of ‘prophecies’ did not occur because of government intervention, NOT because they were wrong (e.g., DDT banned, passage of the clean air and water acts).

(Dialogue 1995)

When the Republican Party won sweeping victories throughout the nation and gained Congressional control in 1994, many politicians saw this as a public mandate for change and as condemnation of Clinton administration policies. The public was apparently weary of Clinton’s gun control measures and health care initiative; they *did*

not, however, want to roll back environmental protections won under Clinton (Wexler 1995).

The independent public-opinion research firm Peter D. Hart Research Associates conducted a survey of 1,200 voters who participated in the 1994 Congressional election and found that few had environmental issues on their mind when they voted. Many believe that environmental laws and regulations do not hamper businesses; 41% of respondents said environmental laws do not go far enough. Most respondents (57% and 63%, respectively) support the Endangered Species Act and favor charging fair market fees for using natural resources from public lands. Members of the public favor requirements meant to prevent the extinction of plants and animals and support charging corporations that mine, log, or graze on government-owned lands (Wexler 1995).

Industry Research

A 1999 study published by the non-profit, San Francisco-based think tank Pacific Research Institute (PRI) reports that even though the condition of the environment has improved, Americans believe that overall environmental quality has decreased. America has, PRI says, reached “a point of diminishing marginal return on our pollution control investment.” PRI concluded that pollution control cost American tax payers \$1,000 per person between 1972 and 1994. Annual industry expenditures to control pollution rose from \$50 billion in 1972 to \$110 in 1994 (in 1994 dollars), totaling more than \$250 billion over 22 years (Penn Well Publishing 1999).

A national consumer opinion poll conducted in 1998 by the Wood Products Promotion Council of the APA-The Engineered Wood Association found that customers’

traditionally positive opinion about wood is threatened by the apparent decline in wood quality and negative perceptions about the environmental practices of the forest products industry. Consumers ranked steel and concrete as better building materials than wood because wood is not, in their opinion, as safe, durable, strong, modern, energy efficient, and earthquake, wind, and fire proof as non-wood materials. Of consumers polled by the APA, 52% said they would choose wood as a building material, compared to 31% for steel and 16% for concrete. According to the APA, actual market shares for these materials are 90%, 1%, and 10%, respectively. Roughly 60% of respondents felt that the quality of steel and concrete had improved over the last 10 years while only 41% believed the same about wood; 20% believed wood quality over the last 10 years has declined. Nearly two-thirds of respondents said they wanted to see more regulation of forest management practices or more enforcement of existing regulations (Longo 1998).

The APA survey found that most people could not correctly define *certified forest*. They did, however, know the definition of and “greatly despise” *clearcutting*. There was, fortunately, a “significant decline” in the percentage of respondents who supported an outright ban on clearcutting after it was explained that clearcutting is sometimes the most environmentally sound method of harvesting lumber. This led surveyors to conclude that education by the wood products industry can help mould public opinion. Broad public relations campaigns meant to change customer opinions do, however, require large sums of money (Longo 1998).

An earlier APA survey conducted in conjunction with the Southern Pine and Canadian Wood Council also found that people do not consider wood a modern material. Wood was, however, rated equally with steel and concrete in terms of perceived

performance as a building material. The poll found that members of the public believe that the country is running out of trees and 30% of respondents said they would support a boycott of wood products if prompted by an environmental group (Keil 1998).

The American Forest and Paper Association (AF&PA) found in its 1994 survey that 62% of the American public does not believe that the forest products industry strikes a fair balance between profits and environmental interests. A Purdue University survey conducted that same year found that 76% of Americans believe that forests in North America are threatened. Public confidence in the forest products industry is diminished, says Linda Brown of Scientific Certification Systems, because the news features “images of denuded lands representing the worst practices...while images of responsible management receive far less coverage.” There is little doubt that improving the perceptions of wood and the timber industry will be a difficult and expensive endeavor. Brown, and many others in the forest products industry, believes that certification is the best, most cost effective way of restoring wood’s tarnished public image (Longo 1998).

In a speech that he gave to CEO’s of Fortune 50 companies at the Greenwich Chamber of Commerce in 1994, John A. Georges, President and CEO of International Paper, spoke about misconceptions that the public has about wood and the environment. He is troubled by the portrayal of the forest products industry as uncaring users of the environment and the effects of this portrayal on public policy. He believes that the five most flawed myths that members of the public have about the forest products industry are:

- 1) the United States is running out of trees,
- 2) unchecked wilderness is better than a managed forest,

- 3) the only way to protect endangered species is to deny access to the land they occupy,
- 4) the paper industry is destroying the South American rainforests, and
- 5) paper recycling saves old-growth forests.

(Georges 1993)

Georges independently addressed each of these issues at length during his speech. He countered these myths by arguing that America has 20% more trees than it did 20 years ago, unmanaged forests are rotting away from pests and disease due, in part, to the National Park System's inconsistent fire management policy, and that extremist preservationists are wrong because endangered species often need help from man to flourish. He concludes by clarifying that the type of wood from trees in South American rainforests is not the type used for making paper and that recycling, though beneficial, will not save old-growth forests. No matter what the process used, fiber inherently loses strength when recycled and it is therefore always necessary to add virgin fiber when using recycled paper. Paper mills also rely on softwood fiber, typically from plantation grown pine, and, no matter what the recycled content, they can not use wood from tropical hardwood forests (Georges 1993).

Academic Studies

James Bowyer of the University of Minnesota has spearheaded several studies into the perceptions that college students, the public, and forest products industry professionals have about wood, natural resources, and the environment. His studies have found that there is a high level of misinformation about forests and their management at university campuses across the country and within the forest products industry. In 1993,

Bowyer surveyed 1,982 students on eleven college campuses and 1,121 employees in the forest products industry (Bowyer 1995). Bowyer in 1997 polled residents in Montana. Survey results were strikingly similar amongst college students, forest products industry professionals, and the general public (Polzin and Bowyer 1999). Bowyer found that Montana residents and students across America believe that environmental conditions are worse than they really are and found that forest products industry knowledge, even among its own employees, is “rather limited.” Some of the most startling figures from Bowyer’s studies are:

- 1) people believe that trees live for thousands of years or until they are cut down,
- 2) 73% of students believe most of America’s forests will disappear by 2050,
- 3) 15% of paper mill employees know how much paper is recycled each year,
- 4) 78% of respondents believe the world is rapidly running out of minerals.

(Bowyer 1995)

Bowyer found that misperceptions of forests and the forest products industry are independent of political preference and location of residence (urban vs. rural).

Parameters that determine the accuracy of respondents’ perceptions are age, household income, and education. Older, wealthier, and better-educated citizens have a more accurate perception of forest products and the environment than do those who are younger, less wealthy, and less educated (Bowyer 1995). Bowyer warns:

Of particular note is the tendency for greater levels of misperception on the part of students and younger age respondents. In view of the fact that all students currently in the nation’s education system (K to college) will begin to assume leadership positions within society in the next one to 20 years, misunderstanding and misinformation regarding forests and wood products among this group seem to suggest a significant and growing problem for the wood-using industry. Ongoing efforts to educate the public at large about forests and forestry also appear warranted.

(Bowyer 1995)

Bowyer argues that besides formal education and training programs, forest products professionals “combating misperceptions...on a daily and continuing basis could make a significant difference” in the ways that the public views our industry (Bowyer 1995). This paper is intended to affirm this assertion to its readers.

Perceptions at Virginia Tech

Methods

I decided to conduct student surveys on campus at Virginia Tech after reading that Bowyer found that results among college students across the country were similar and that those results were consistent with responses from Montana residents. I was curious as to what wood science students thought and wanted to see how those results compared with Bowyer’s results from forest products industry professionals. I contacted university professors with whom I had amiable relationships and I thought might be willing to assist me. I distributed surveys to classes taught by the professors who were willing to help.

I created a survey that I believed was succinct, easy to understand, and would give reliable insight to what Virginia Tech students know about wood and believe about environmental issues (please see Appendix A). I wanted students to be able to complete the survey as quickly as possible to not take up an inordinate amount of professors’ class time. The survey is based largely on Bowyer’s surveys but contains original questions of my own to gain insight to issues that interested me that were not addressed by Bowyer. Survey questions one through nine were taken from Bowyer word for word or were rewritten for brevity and clarity. The remaining three questions were my own creation.

I surveyed students enrolled in the Wood Science and Forest Products curricula at Virginia Tech as well as students outside the department. I surveyed wood science students not so much as to measure what they had learned in their classes but mainly as a benchmark against which to compare responses from non-Wood Science and Forest Products students. I purposely tried to survey students from the College of Arts and Sciences and the Pamplin College of Business to represent what I believe to be typical American citizens. I did not want to survey students in such majors as Environmental Engineering, Biological Systems Engineering, or Forestry because they most likely have background training in environmental issues and may have affected survey results unpredictably. I wanted to measure as best I could what students not affiliated with environmental sciences know and think about wood and the environment. I tried to focus on the students most likely to make future business and political decisions.

Sample Size and Characteristics

Forty students from the Department of Wood Science and Forest Products were surveyed in two classes. All were in their junior or senior year and had taken significant coursework in wood science and natural resources. This sample group is hereafter referred to as “wood students.”

The sample selected from Virginia Tech meant to represent the general population of the United States consisted of 253 students in the College of Arts and Sciences and the Pamplin College of Business. Two political science classes, one history class, one MBA class, and a psychology class were surveyed in order to ensure that people from a wide

variety of academic majors and personal backgrounds completed the survey. This group is hereafter referred to as “non-wood students.”

Expected Results

I expected wood students to do well on the survey. I expected most would answer at least nine of the 12 questions correctly. They have had sufficient class training in wood science and should already have been exposed to all or most of the issues addressed in the survey.

I expected non-wood students to perform substantially worse on the survey than wood students. I expected a much greater variance in the number of correct responses for non-wood students. I also expected a greater dispersion in the incorrect answers that they selected for each question. Some non-wood students probably have no interest or training in wood or environmental issues and get what they “know” from mainstream media sources and word of mouth. Others undoubtedly are more environmentally conscious and may either have known the correct survey answers or may have relied on preconceived, incorrect notions furnished by agenda-setting environmentalists. I expected an overwhelming majority of non-wood students to say that South American rainforests were disappearing because of logging and paper production. I also expected most non-wood students to choose “none of the above” when asked what products are made out of wood.

Results and Discussion

Results from the survey conducted at Virginia Tech closely parallel Bowyer's survey results. The knowledge that wood science students at Virginia Tech have about wood is consistent with Bowyer's findings among forest products industry professionals; the level of knowledge that non-wood students in Blacksburg have about wood is likewise consistent with Bowyer's findings among college students across the U.S. and the general public in Montana. For a complete summary of survey results and a detailed comparison with Bowyer's research, please see Appendix B.

As expected, there was a narrower dispersion among the survey results of Virginia Tech wood students compared to non-wood students; wood students also answered far more questions correctly. The average number of correct answers obtained from wood students was 8.725, with 9 being the most common number of correct responses (mode). The average for non-wood students was 4 with a mode of 3. The number of correct responses from wood students ranged from 5 to 11; the range for non-wood students was 0 to 8.

Eighty-three percent (83%) of wood students correctly identified that there is more forested area in the United States today than there was in 1920. This compares to 21% of non-wood students at Virginia Tech and 27% of the public surveyed by Bowyer. Bowyer did not ask this question to college students or forest products industry professionals.

When asked whether or not the U.S. was a net exporter of raw materials used by industry, survey results were very similar. Sixty-five percent (65%) of Tech wood students and 63% of industry workers asked by Bowyer correctly said that the U.S. is a

net importer of industrial raw materials. Students I surveyed and Bowyer's respondents (students and the general public) were split 50-50 on this question. The United States is in fact a net importer of every category of industrial raw material (metal, cement, petroleum, and wood) (Bowyer 1995; Polzin and Bowyer 1999).

When asked if recycling paper in the United States would help stop deforestation in South America, 95% of wood students correctly responded "no." Sixty percent (60%) of non-wood students at Tech incorrectly answered "yes," as did 80% of Bowyer's students who claimed increased recycling in the U.S. would help decrease deforestation *of domestic old-growth trees* (my wording of the question slightly differed from Bowyer's). Paper mills in the United States rely on plantation-grown softwoods. Trees in tropical rainforests are diverse hardwood species incompatible with currently available papermaking processes. The South American population harvests trees for fuel wood and later converts the land to agricultural use. As for saving domestic old-growth forests, research has shown that recycling, though beneficial, will not reduce the current demand levels for virgin wood fiber (Georges 1993).

Eighty-five percent (85%) of Tech wood students (compared to 69% of forest products industry professionals) correctly said using wood as a building material is less damaging to the environment than using plastic, steel, or cement. The response from non-wood students at Tech, and students and the public surveyed by Bowyer, was 35%. Studies have shown that the energy requirements for extraction and conversion for non-wood products are much greater than for wood, as is the level of pollutants released into the atmosphere (Koch 1992).

An overwhelming majority of those surveyed, no matter what their profession or college or major, correctly said that consumption of forest products has increased in the United States since 1970. There is disagreement, however, on whether there is more wood grown or harvested each year in this country. Ninety percent (90%) of wood students at Virginia Tech correctly stated that there are more trees planted each year in the United States than are cut down (net forest growth exceeds net harvest). Non-wood students at Tech and students surveyed by Bowyer responded 68% and 65%, respectively, that annual harvest exceeds growth. For most of the last 60 years, and consecutively for the last 40, net growth of timber has exceeded net harvest (Bowyer 1995; Polzin and Bowyer 1999).

Seventy percent (70%) of wood students at Tech, versus 15% of non-wood students, correctly estimated that forests cover 70% of U.S. land area today that was covered by forests in 1670. Eighty-five percent (85%) of non-wood Tech students, and 76% of students and 70% of the public surveyed by Bowyer, underestimated the land area in America still covered by forests.

A large majority of all survey respondents underestimated the state of recycling in the American papermaking industry. Only 25% of wood students knew that 45% of the paper produced in the U.S. each year is recycled (Polzin and Bowyer 1999). Eighty-eight percent (88%) of non-wood students underestimated the amount of paper recycled each year in the United States. This is consistent with Bowyer's findings of 82% of the public and 88% of *wood industry professionals* who underestimated paper-recycling levels. The percentage of wood students who correctly identified the recycled content of paper produced each year in the U.S. (roughly 40%) was a scant 38%. Non-wood students

(88%) and all of Bowyer's respondents (94% of students, 78% of public, and 85% wood industry professionals) underestimated the recycled content of new paper. Forty-two (42.3) million tons of paper and paperboard were recovered for recycling in 1996 in the U.S., an amount equivalent to 44.6 % of domestic production. Of this amount, 34.3 tons (37.2%) was used in production of new paper in the U.S. Most of the remaining amount was sent abroad for paper production in foreign countries (Polzin and Bowyer 1999).

Nearly half of the wood students surveyed (48%) correctly stated that the primary purpose of the U.S. Forest Service since its creation in 1905 has been to ensure a steady supply of timber to the forest products industry. The Forest Service states in its first *Use Book* that, "the general objective of the forest reserves is to... 'preserve a perpetual supply of timber for home industries'" (Fedkiw 1998). Most non-wood students (62%) and a third of wood students (32%) believe that the primary mission of the Forest Service is to preserve forests for wildlife habitat, watershed protection, and erosion prevention rather than to preserve forests to provide raw material for the wood industry. Few respondents (8% of wood students versus 4% of non-wood students) believe that the primary goal of the Forest Service is to prevent and extinguish forest fires.

A full 95% of wood students correctly identified the main cause of deforestation in South America (cutting down trees for local agricultural use and as firewood). Two percent (one student) said South American forests were cut down for lumber and paper production; another said it was to make room for highways and urban sprawl. I expected the vast majority of non-wood students to say South American deforestation is caused either by lumber and paper production or urban sprawl, rather than for local farm use and firewood. Exactly one-third of non-wood students picked each of these three possible

responses, while only 1% (3 students) chose the response, “They are not disappearing- it is just media hype.”

When asked which products come from wood besides lumber, plywood, and paper, a full 90% of wood students correctly chose “all of the above” (rayon, explosives, plastic, and food additives). Fortunately, no wood student chose “none of the above.” I expected an equal number of non-wood students to choose either of these choices. Roughly an equal number did, as 37% chose “all” and 30% chose “none.” After I handed out the survey, but before I tabulated the results, I worried that the last question was poorly worded. I felt that I should have asked, “which are *derived* from wood” instead of “which are *made* from wood.” I felt that many students would answer “none” because plastic is “obviously” not *made* from wood; I likewise thought many would choose “all” because respondents may have thought it was a trick question. “Rayon” was the answer I expected most students to pick if they did not choose “all” or “none.” My assumption was correct, as 19% of non-wood students chose “rayon.” I was surprised at the number of students who chose “plastic” (9 students, roughly 3% of respondents) or “food additives” (6%) as their sole selection of possible responses. The remainder (5%) chose “explosives.”

Summary of Misconceptions

The public at large knows that consumption of forest products has increased significantly since 1970 and that many products, not just lumber, plywood, and paper, are made from wood. Most people know that more wood fiber is grown each year than is harvested. The public’s correct perceptions of the forest products industry are limited.

Education and public awareness programs are undoubtedly necessary to curtail the myths and half-truths pertaining to our industry that prevail in society.

Wood science students and forest products industry professionals have a better understanding of the general use of wood and raw materials, the true cause of tropical deforestation, and the environmental benefits of wood than does the general public. The knowledge that one would think forest products industry professionals should have is also less than what one would expect. Training and additional education even within the forest products industry appears necessary.

The public at large believes that the environmental situation is worse than it really is, underestimates the extent of paper recycling in the United States, and does not realize the true nature of deforestation, the traditional role of the Forest Service, or the environmental benefits of using wood as a building material. The most damning misperceptions that the public has about wood and the forest products industry are:

- 1) forests in America are disappearing,
- 2) recycling will help save tropical rainforests and domestic old-growth trees,
- 3) wood is not an environmentally sound building material, and
- 4) the use of substitute materials such as steel, plastic, and cement is less damaging to the environment than using wood.

Such misperceptions affect the atmosphere in which the forest products industry must operate and have a profound impact on the industry because they affect how the general public views wood as a resource. People with preconceived notions based on these perceptions directly or indirectly affect how trees are harvested, how successful forest products are in the market place, and how substitute materials may easily gain consumer acceptance.

The rise of the American environmental movement has altered the way that the government regulates the forest products industry, impacted the effectiveness and purpose of the USDA Forest Service, and adversely changed the way the forest products industry operates. The Forest Service used to build roads throughout the national forest system to assist the timber industry in acquiring logs and so its own scientists could monitor (and ultimately prevent) insect infestation and uncontrolled fire. The Forest Service is now directed by the executive branch to increase its area of roadless “wilderness” area and favor recreational users of forests over loggers (CQ Researcher 1998).

Since members of the general public already believe that wood is less environmentally sound than other building materials, they are more willing to accept the rhetoric of environmentalists and producers of substitute materials. Every year, more and more architects, builders, and homeowners are specifying that homes be constructed with steel studs instead of wood. They believe that using any material that does not come from trees is preferable to using wood (Barreneche 1994; Munk 1994). If the forest products industry does not soon make an organized and coordinated public effort to promote the environmental benefits of wood and dismiss the false rhetoric of its critics, then it will continue to unnecessarily lose market share to substitute materials and needlessly spend resources defending its position.

Chapter 3

American Environmental Movement

History

The American environmental movement has its roots in the last part of the nineteenth century as industrialization was taking a firm grip on the American economy, Native American Indians were disappearing, and the wild frontier was coming to a close. Early conservationists dreamed of controlling rivers with dams and wanted to “reclaim land for civilized purposes by draining swamps and irrigating deserts” (Nash 1990). We have come a long way since those naive days. Now radical environmentalists want to destroy dams to return lakes and rivers to their natural state and federal laws are in place to protect, not drain, swamps such as the Florida Everglades. We have come a long way since the days of Gifford Pinchot (“the first American to choose forestry as a career”) who said that the first principle of conservation is development, and that conservation demands the welfare of this generation first, and only then the welfare of generations to follow (Nash 1990).

John Muir, Aldo Leopold, Henry David Thoreau, and Gifford Pinchot are just a few of the people associated with America’s early conservation movement. One of the earliest of these forward-thinking men is not often recognized for his contributions to the environment but is known as America’s most flamboyant president. Theodore Roosevelt spoke in 1905 about the rate of forest destruction and the need to “prevent an inevitable timber famine.” Roosevelt was deeply committed to an activist role of the government in maintaining natural resources and working to reconcile public interest with those of the business community. Roosevelt was fundamental in creating the Forest Service within the Department of Agriculture in 1905 to further the work of resource conservation (DiNunzio 1994). Conservation and environmental efforts became national political

issues when President William Taft failed to continue Roosevelt's enthusiasm for natural resource protection. The outbreak of World War I quickly made Americans change their priorities, but no one forgot the "political potency" of environmentalism (Nash 1990).

Contemporary Environmental Groups

Numerous influential environmental groups have risen to prominence both in America and internationally. Some have their roots in the early days of the environmental movement. Some arose out of the anti-war and equal rights groups from the 1960's; others came about only in the last decade. They each have varying goals, methods, constituencies, and degrees of radicalism. Some are as benign as encouraging recycling and promoting videos on "green living." Others want to tear down dams in the West to allow America's rivers to flow freely (Elvin 1999).

One of the most recognized environmental groups is the Sierra Club. Founded in 1892, the Sierra Club seeks to end all commercial logging on public lands. It claims that the timber industry "has turned our publicly owned National Forests into a patchwork of clearcuts and logging roads" and "poorly planned development is threatening our environment, our health, and our quality of life." The Sierra Club is actively trying to restrict urban sprawl, protect wilderness areas by prohibiting road building and other development in America's "last wild 100 million acres," and curtail water and air pollution (Cosgrove and Zaleha 1999).

One of the oldest and most respected conservation groups in America, the National Audubon Society was founded in 1905 and currently has its headquarters in New York City. The goal of the society is to conserve and restore natural ecosystems by

focusing on birds and other wildlife for the benefit of humanity and the Earth's biological diversity. They claim over half-a-million members and operate 100 bird sanctuaries throughout the U.S. The society lobbies Congress to reauthorize the Endangered Species Act, promote a responsible U.S. population policy, preserve America's endangered forests, conserve marine wildlife, restore water flows to enhance wildlife, and protect corridors for migratory birds (National Audubon Society 1999).

Another widely recognized but not as long-lived environmental group is Greenpeace. Canadians founded Greenpeace in 1971 to protest American atmospheric tests of nuclear weapons. Today Greenpeace is an international, independent, non-political organization that uses “non-violent, creative confrontation to expose global environmental problems and to force solutions that are essential to a green and peaceful future.” Greenpeace claims 2.5 million members in 158 countries (Greenpeace 1999).

Two of the most vocal and controversial environmental groups arose in just the past few decades: the Rainforest Action Network and Earth First! The Rainforest Action Network (RAN) has since 1985 been working to protect tropical rainforests and the human rights of those living in and around those forests. RAN claims to have played a key role in strengthening the rainforest conservation movement through supporting activists in tropical countries as well as organizing and mobilizing consumers and community action groups throughout the United States. Their first challenge was to bring the “plight of the rainforests” to public attention through education, communication, and direct action. RAN says on its Web site:

We began by convening the first international rainforest conference where activists from 35 organizations formulated a plan of action. This conference was followed by others which have helped to catalyze the growing world rainforest movement. In our first direct-action campaign, we led a nationwide boycott of

Burger King. Burger King was importing cheap beef from tropical countries where rainforests are denuded to provide pasture for cattle. This campaign succeeded in several ways. After sales dropped 12% during the boycott in 1987, Burger King cancelled \$35 million worth of beef contracts in Central America and announced that they had stopped importing rainforest beef. The rainforest issue also began to gain ground in the public's awareness, and consumers began to appreciate the power they have to change things through their purchasing choices. (Rainforest Action Network 1999)

RAN's goals and inflammatory language are clearly evident in the following passage that is also taken from their Web site (emphases added):

Through media campaigns, conferences, and publications, our efforts have helped to *make the rainforest issue the cause to celebrate* that it has become in the U.S. In order to keep the rainforest issue from becoming just another passing fad that fades before the rainforests are actually saved, *our efforts must be unrelenting*. Consumer education continues to be an essential activity of the Network. American consumers are *beginning* to understand the critical role of our consumption patterns in tropical deforestation, and *how our actions here at home* can help to protect rainforests abroad. A major focus in this regard is the tropical timber trade and our *call for a national ban on the import and consumption of tropical timber and tropical timber products*. We are asking consumers to *boycott products made from tropical woods*, unless they are verifiably produced from ecologically and socially sound logging operations. (Rainforest Action Network 1999)

RAN spreads its message through its international network by organizing protests and publicizing issues in the national media. RAN for the past two years has protested and harassed Home Depot for selling wood products supposedly made from trees that come from old-growth forests. Home Depot recently said it would end the sale of wood products from endangered forest areas by the end of 2002. RAN targeted Home Depot because they are "currently the world's largest retailer of old growth wood products." Their next target is what RAN calls "the Foolish Five," five retail lumber distributors that RAN claims are also selling wood products made from old-growth forests. RAN's goal,

“with your help,” is to “transform the entire do-it-yourself (DIY) industry” (Rainforest Action Network 1999).

Earth First!, arguably the most radical and militant environmental group ever, was founded in 1979 by David Foreman and claims 15,000 members. Earth First! members have been described as “eco-thugs and eco-terrorists” who pour sand into fuel tanks of logging machines and drive metal spikes into trees that are slated for harvesting. They have also been known to tear down power lines, sink whaling ships, and destroy oil-exploration equipment, activities known as “monkeywrenching.” Members believe that all species, not just humans, have equal value and relish the fact that their militant actions bring them into conflict with mainstream environmental groups (Foote 1990).

Earth First! says on its Web site, “we do not believe that it is enough to preserve some of our remaining wilderness. We need to preserve it all, and it is time to recreate vast areas of wilderness in all the planet's ecosystems, remove developments, and reintroduce extirpated wildlife.” Earth First! claims “the ideas and manifestations of industrial civilization are anti-Earth, anti-woman, and anti-liberty.” They claim to be developing a new bio-centric paradigm based on the intrinsic value of all natural things. They likewise believe that restoring wildlife for its aesthetic value is “elitist” and does not support wise management and use of natural resources (Earth First! 1999).

Impact of Environmental Groups

Environmental groups and their members have beneficial and adverse impacts on the way Americans view the environment. Greenpeace and the Audubon Society offer booklets and videos on “green” living; they also create awareness about such issues as nuclear power and toxic waste. Each has its constituent group (nuclear protestors and bird watchers), but they mainly shy away from issues and do not lobby government agencies that impact the forest products industry.

To their credit, the Rainforest Action Network says in their mission statement “We are asking consumers to boycott products made from tropical woods, *unless they are verifiably produced from ecologically and socially sound logging operations*” (Rainforest Action Network 1999). RAN is the one mainstream environmental group that, despite some maverick members whose behavior may raise eyebrows, reasonably focuses its efforts towards forests and forest products rather than the whole environment. RAN is one of only a few environmental groups that appears willing to work cooperatively with government and forest products companies to find reasonable and scientifically justified means of harvesting timber sustainably and protecting remaining forests (Foote 1990).

Contrary to RAN’s willingness to work with the forest products industry using conventional means, Earth First! is an environmental group whose members are so far on the fringe that reasonable methods of conciliation appear impossible. Earth First! wants to “take back and rewild” one-third of the United States and denounces established environmental groups (such as the Sierra Club and the National Audubon Society) for their “willingness to bargain with the enemy” (Foote 1990). Earth First! co-founder Dave

Foreman calls mankind “a pox upon the planet, a diseased organism,” and “welcomes AIDS as a blessing to reduce over-population” (Evans-Pritchard 1996).

The Sierra Club, though not as militant as Earth First!, is a left-wing radical environmental group with far reaching support and motives. The Sierra Club claims that recreation in National Forests contributes \$40 to the American economy for every dollar generated by logging and creates 30 times as many jobs. Sierra Club members decry the government for spending two billion taxpayer dollars on logging roads between 1992 and 1997. The Club maintains that 230 endangered species rely on old-growth forests for their habitat and want to end all logging from public land (Cosgrove and Zaleha 1999).

The Sierra Club attacks both the federal government and the timber industry. Like the peace movement of the 1960' and 70's that criticized the government for its close ties to the military-industrial complex, the Sierra Club blames deforestation in America on the close relationship between government (particularly the Forest Service) and the timber industry. Sierra Club members are most vocal about the 1995 Salvage Logging Rider, claiming that “Congress, reading the invisible ink used to draft the Republican Contract on America (sic), had timber industry lobbyists write the bill for them. It promotes ‘forest health,’ but is being used in places to enter unprotected wilderness.” The Club says “multinational corporations that are cutting [old-growth forests] leave a moonscape behind; theoretically, they will not be ‘clearcutting’ if one or two healthy trees are left behind. The remaining tree, or trees, will continue to drop seed cones, saving the expense and effort of tree-planting” (Bass 1996). The Sierra Club does not think highly of the Forest Service and its logging plans, nor does it hold the forest products industry in high regard. The Club does, however, make every effort to

perpetuate the notion that all the industry does is cut down everything in sight without making any effort to replant trees or harvest trees sustainably.

Few historians and no environmentalists dispute the impact that Rachel Carson's book *Silent Spring* had on the American environmental movement. Meant to spread awareness of chemical pesticides and pollutants, the publication and the fury it provoked were the fundamental reasons that the federal government banned the pesticide DDT. There is a new book on the market, *The Dying of the Trees* by Charles Little, that environmentalists liken to *Silent Spring*. Meant to disclose "a range of human-caused maladies," the book focuses on "the disastrous aftermath" that clearcutting has brought to trees and forests. With "relentless dedication to the truth...[and] brave determination to look reality in the face and describe it for what it is," *The Dying of the Trees* examines what one reviewer calls "the decline of the great American forest under an onslaught of industrially induced plagues" (Little 1999). The author's goal in writing the book and disdain for the forest products industry is evident in the following excerpt:

Looking at the history of tree death along a time line, one can see that the dramatic incidents of widespread tree mortality among native species have occurred mainly in this century, in the industrial age, and have taken place in the replacement forests after the great national orgy of tree felling and land clearing between 1860 and 1890. And now, as we have seen, the tempo of catastrophe has been increasing in the post-World War II era...Ruthless logging has changed the composition of the forests...where ancient forests are sacrificed in the politics of jobs.

(Little 1999)

Public Ambiguity

Even though more Americans than ever before consider themselves environmentally conscious (Foote 1990), environmental activism apparently is on the decline. Environmental organizations are seeing a decrease in their membership and revenue levels. Voters no longer support expensive public referenda that would create new environmental regulations. Environmentalists, politicians, and journalists view this as the voting public's satisfaction with the status quo (Barber 1991).

Gregg Easterbrook of the liberal *New Republic* magazine attributes voters' environmental apathy to poor tactics used by the environmental movement. He says, "Alarmism may eventually create a Chicken Little backlash; as the years pass and nature doesn't end, many people may stop listening when environmentalists issue warnings" (Barber 1991). Mary Nichols, a lawyer with the Natural Resources Defense Council, arrogantly describes the mentality of the environmental movement: "We thought we did not need to convince people of the merits of our argument. We thought we did not even need to respond to the arguments against (the environmental movement)" (Barber 1991). Environmentalists feel that they need to broaden their appeal to mainstream Americans. The problem with this, analysts say, is that as more politicians and industries take the environmental middle ground, less people are likely to accept the warnings and rhetoric of established environmental groups (Barber 1991).

Chapter 4

Political and Legal Issues that Affect the Timber Industry

Introduction

Logging on land owned by the federal government (“publicly-owned” land) has always been controversial, as has the role of the Forest Service since it was created within the Department of Agriculture in 1905. Despite what most people think, the primary purpose of the Forest Service has always been to supply wood to the forest products industry. The role of the Forest Service, as it says in its original *Use Book*, has been to preserve a perpetual supply of timber for home industries; national timber was used whenever it was needed to meet national demands or supplement the industry’s supply from privately-owned lands (Fedkiw 1998). Watershed and habitat protection, erosion prevention, and biodiversity have always been secondary to supplying the forest products industry with logs. The Forest Service’s annual budget and promotion for its employees have traditionally been based on timber production.

Congress has a difficult relationship with trees as forests have always created sharp division among legislators. Each of the two sides assumes that the other has a worse motive. One side is perpetually accused with pillaging land in the name of jobs while the other is accused of being a bunch of environmental extremists who do not want a single footprint left in the forest (Pope 1999).

USDA Forest Service

Until World War II, timber harvests in national forests were limited. The timber on national forest land was not desirable because it was often spindly, low in quality, and largely inaccessible. The timber industry was not concerned about a steady supply since

there was plenty of high quality timber available from privately-owned land (Roberts 1997).

Timber harvests from national forests grew steadily from 1905 until 1930. From 1930 until 1940, timber harvests leveled off at 1.7 billion board feet (bbf). Timber harvests from federally-owned land tripled by 1944 since the war effort required large amounts of wood to construct factories, hangers, pallets, and shipping crates. After the war, returning veterans and their families wanted homes in newly designed suburban areas. The lumber and home-building industries experienced unprecedented demand from returning veterans and the baby boomers that soon followed. Timber harvests from national forests steadily grew from 4 bbf in 1950 to 12 bbf in 1970. Actual harvests during these years were 10% less than what was allowed. From 1970 until 1987, federal timber harvests varied between 7 and 12 bbf as housing starts fluctuated with the strength of the economy. Timber harvests during these years averaged 10 bbf until they peaked in 1987 at 13.1 bbf (Fedkiw 1998).

After 1989, harvests from federal land dropped significantly because of environmental concerns and the impact that environmental groups had on America's political institutions. Environmentalists since the 1970's had been advocating laws that required the Forest Service to promote non-timber uses of national forests (Roberts 1997) and end the practice of clearcutting (Taylor 1998). Throughout the 1980's, pro-timber Congress members prevented the Forest Service from lowering its allowable cut. Environmentalists responded by filing lawsuits that prevented the harvesting of old-growth forests under the guise of saving the North American spotted owl. On May 23, 1991, U.S. District Circuit Court Judge William Dwyer ruled that the Forest Service was

forbidden from selling trees or cutting timber in the Pacific Northwest until the agency could scientifically demonstrate how owls and logging could peacefully coexist (Roberts 1997). Judge Dwyer started what would become known as “the Owl War.”

Appointed by Ronald Reagan, Dwyer has been called the most feared environmentalist in the Pacific Northwest and targets the Forest service for its “institutional inability” to follow National Environmental Policy Act provisions. Throughout the 1980’s, Dwyer effectively shut down the logging industry in Oregon and Washington because of the threat it posed to the North American spotted owl and 180 other endangered species. Dwyer stifled the timber industry and criticized the Bush administration’s forestry plan for its “remarkable series of violations of environmental laws” (St. Clair 1999).

As a result of Dwyer’s decisions, annual timber harvests from national forests fell from 20 bbf in 1982 to just 2 bbf in only 10 years. Neither the timber industry nor environmental groups are satisfied. Forest products companies complain that the inability to harvest from national forests increases costs and dulls its competitive edge; environmentalists do not see Dwyer’s logging injunctions as going far enough. Tim Hermach, president of the Oregon-based Native Forest Council, says, “The Clinton forest plan is just as bad as anything offered during the Bush years. [It] may be even worse because it claims to save old-growth [trees] and protect owls and salmon. But underneath it continues to log just as rapaciously as ever” (St. Clair 1999). The Clinton administration’s forestry plan is criticized because spotted owl populations have continued their decline at 8% per year (St. Clair 1999) and timber sales from federal land have slowly increased to 3.5 bbf per year (Kriz 1998).

With the arguable success of the Owl War behind them, environmentalists now insist that *all* logging from federal lands be prohibited. The Forest Service has subsequently been criticized for its focus on commodity timber production and ignoring such societal values as wildlife protection and recreation. Forest Service employees negatively view and resent the increasing pressure from Congress and the President to address non-timber issues (Mohai and Jakes 1996).

In 1997, President Clinton appointed Michael Dombeck Chief of the Forest Service. Trained as a fisheries biologist, Dombeck joins the growing ranks of Forest Service employees who are not foresters or engineers but are trained biologists, hydrologists, and wildlife experts. Dombeck was chosen to instill the agency with “non-commodity values based on environmental and ecological concerns” (Brown and Harris 1998). He sees his greatest challenge as balancing the interests of environmental groups who oppose logging on federal lands with pro-timber Republicans who accuse him of being more concerned with political correctness than resource management (Satchell 1998). Distrusted within the agency that he leads, Dombeck has the daunting task of balancing the demands of an environmentally enlightened public with America’s continuing demand for forest products (Dombeck 1999). His promise to temporarily halt road construction in old-growth “virgin forests” pleases no one. Environmentalists say that it does not go far enough to protect wilderness areas; the timber industry maintains that logging in national forests is essential to preserve jobs. Even Forest Service officials insist that building new roads and maintaining existing ones are necessary to monitor forest health and prevent fires. Dombeck says that while the Forest Service formerly rewarded managers for producing logs, cows, metals, and visitor days from national land,

he will award promotions based on which managers have the healthiest streams and forests and most diverse wildlife habitat (Taylor 1998). Clearly the traditionally perceived Forest Service role as ensuring a steady timber supply to the forest products industry is in jeopardy.

Perpetually in a bind, the Forest Service is still between two warring parties (one that wants to utilize forest resources for industrial production and another that wants to preserve forests under a glass jar). Sawmill owner Leon Favreau mirrors the perception of many in the industry who say that the Forest Service has gotten very political under the Clinton administration and believe that there are directives from the top to harvest less, let foresters go, and keep biologists. Environmentalists, however, believe that even under Clinton, the Forest Service is still run with pro-timber bias (Jacobson 1997). One of the biggest criticisms of the Forest Service is that the expense it pays to administer timber sales, prepare sites for logging, build roads, and replant seedlings outweighs by hundreds of millions of dollars the revenue it generates from timber sales (Baden and Lawrence 1997; Goldman and Boyles 1997; Pope 1999). Federally sponsored timber sales and the supply of wood that they provide for industry generate a consistent loss to the American taxpayer and controversy for many critics.

Salvage-Logging Controversy and the Owl-War, Part 2

To the dismay of environmentalists, President Clinton signed into law the Logging Rider to the 1995 Reversions Act. Meant to provide disaster relief for victims of California floods and the Oklahoma City bombing, the Reversions Act was certain to pass. Timber lobbyists saw an opportunity to “sidestep” environmental laws by tacking

the Logging Rider onto the Recessions Act. Later declared his “biggest mistake,” Clinton passed the rider to allow logging in areas where trees were, or soon would be, destroyed by fire, wind, or insect infestation. It suspended existing environmental requirements such as the 40-acre limit on clear-cut areas, environmental impact assessments, and endangered species protections. It also limited the time that citizens could challenge proposed timber sales in court (Goldman and Boyles 1997). Because it was a rider, Congress and the president could vote only on the entire bill, not merely parts of it. Because “salvage” was so broadly defined in the bill, any amount of timber could be cut as long as one log fell under the definition of salvageable timber (Jacobson 1997; Taylor 1998).

Paper companies and panel producers are increasingly using wood chips to furnish their manufacturing plants. Chips are easier, cheaper, and safer to store and transport than whole logs. Chips mills are also relying more on remote chipping facilities rather than chipping whole logs on site. With the closure of much of the Pacific Northwest to logging for the sake of the spotted owl, many manufacturers moved to the southeastern United States. With them they brought efficient manufacturing technology which, in turn, encouraged the proliferation of chip mills throughout the South. In the South, from Virginia to Florida and as far west as Missouri, the number of chip mills has increased in the last ten years from 40 to 140 (Hollingsworth 1997; Sohn 1998; Uhlenbrock 1998; Bowman 1999).

Critics claim that chip mills are a problem because each mill has a capacity to produce between 200,000 and 500,000 tons of chips per year, causing a million acres a year throughout the South to be clear-cut to supply the mills (Hollingsworth 1997).

Critics claim that the mills will chip all trees no matter what their size (Bowman 1999), and that the chip industry will cause massive clearcuts and a 59% increase in hardwood harvests by 2010, an amount some claim the South can not sustain (Shiffer 1998).

The Dogwood Alliance, an organization made up of 30 citizen groups primarily in North Carolina, is an environmental group that is gaining influence. They rally against and disseminate information about the “dangers” associated with the explosive growth of chip mills in the southeastern United States. They claim on their Web page:

Today we are experiencing a second wave of deforestation as large pulp and paper industries move east. But this time around the technology is faster, more efficient, and more damaging. Highly mechanized machines have replaced the handsaws and horses, resulting in much more rapid deforestation. They encourage massive clearcutting...with their limitless and indiscriminate appetite for trees...to meet industry-driven demand for paper.

(The Dogwood Alliance 1999)

Apparently the Dogwood Alliance does not realize that it is *consumers* who demand paper, rather than the paper industry forcing it upon them.

Like environmentalists who chose the spotted owl to further their cause in the Northwest, chip mill opponents are using an issue to indirectly attack what they perceive as the ultimate evil. Chip mill opponents are using provisions of the EPA's Clean Water Act in an attempt to stop chip mill construction. Opponents are trying to get local governments to halt construction of new chip mills and not issue permits to chipping companies until environmental impact studies are complete. The Dogwood Alliance has even tried to get former Tennessee Governor Al Gore to sponsor a moratorium on chip mill licensing throughout the entire South (Sohn 1998).

Forest industry supporters say that chip mill opponents have nothing to worry about and are intentionally misleading the public. The chip mill is not an industry in and

of itself; few trees, if any, are harvested solely for chip production (Shiffer 1998).

Industry supporters accuse chip mill opponents of using selective data in their argument and of intentionally spreading “environmentalist rhetoric and misinformation” in their claims that the South can not sustain the clearcutting required to supply chip mills. Even the Forest Service says that there is little cause for concern; their own studies found that forest growth in the South exceeds harvest and that clearcuts in the South make up no more than 12% of the total land area (Bowman 1999).

The controversial Salvage Logging Rider of 1995 has expired. The chip mill debate, however, is gaining momentum. It is another political issue that will once again put the forest products industry on the defensive against environmentalists. It is now commonly called “the Spotted Owl War, Part Two.”

Current Legislation

Since the 1995 salvage timber fiasco, President Clinton has worked to improve his environmental image. He says that national forests are “more than a source of timber and will no longer be paper plantations.” With his ally Dombeck at the helm of the Forest Service, President Clinton will use internal Forest Service procedures to implement his environmental goals rather than trying to push legislation through the Republican-controlled Congress. In 1999, Clinton convinced Dombeck to halt road construction in 33 million acres of national forest land for 18 months. Clinton now wants to permanently stop road building in an additional 55 million acres of national forest land. Republicans in Congress and timber industry executives decry the plan because it

will increase the risk of fires and insect infestation in forests and cause even more of the forest products market to go overseas (Llanos 1999).

Members of the GOP and the timber industry are not the only ones who oppose Clinton's effort to end road construction and maintenance in the nation's forests. Scott Schlarbaum, associate professor of forest genetics at the University of Tennessee, testified before Congress in November 1999 about this issue.

The road building ban and potential elimination of logging...in the roadless areas will augment existing management problems and raise the probability of catastrophic fires. Management options to control pests, prevent fuel load accumulation, or to fight massive fires are already relatively limited in these areas. Catastrophic events such as pest infestations, or wind and ice storms, have periodically caused extensive mortality over large areas within national forests.

(Federal News Service 1999)

The Environmental Protection Agency (EPA) recently introduced additional rules to the Clean Water Act that would increase the scope of the agency's authority over states and businesses. The proposed rules change the maximum amount of pollutants- the Total Maximum Daily Load, or TMDL- that manufacturing industries can put into bodies of water. States are currently required to identify all sources of water pollutants and delegate responsibility for pollution accordingly. The TMDL program has never been a major means of improving states' water quality since tracing the source of every pollutant back to its source is difficult. States have used other more effective means of controlling water pollution and improving water quality since the Clean Water Act's implementation in 1977 (LiveWire 1999).

The proposed rules change to the Clean Water Act, if implemented, will have two profound effects on the forest products industry. Mills would have to invest in pollution

control and water treatment equipment. Few small sawmills can afford or are willing to spend the large amounts of money required to obtain this technology. More importantly, it will shift control of private forest management activities from states to the federal government. This would leave forestry operations open to “all kinds of new regulations and numerous lawsuits from anti-forestry organizations aimed at stopping harvesting and other silvicultural activities that they oppose” (LiveWire 1999).

As Congress puts together the budget for fiscal year 2000, Congress members are once again using riders to pass legislation that would otherwise not pass muster during open debate. Among the riders is one that would increase logging in Alaska. Again environmentalists are criticizing riders as “back door tactics to pass bills that Congress hopes no one will notice as they get lost in the shuffle.” Congress is not the only one playing the rider game; President Clinton used a rider to ask for \$600 million more for the Land and Water Conservation Fund (Mullins 1999).

Clinton is determined to limit road construction on America’s remaining wilderness area. By executive order he by-passed Congress and instructed the Forest Service to prohibit development on 55 million acres of roadless area. Republicans attack Clinton by saying he is trying to end his presidency on a positive note; they point out that in the previous seven years, Clinton has not tried to designate a single acre of land as wilderness (Jansen 1999).

The multiple use argument of national forest land is not focused on logging limits or prohibitions, but on closing off areas to new road construction. This would essentially put these areas out of the reach of lumber companies. Ironically, the multiple use argument is often used to promote the rights of off-road recreational vehicle owners

(Fedkiw 1998; Jansen 1999). The government wants to protect wilderness areas from logging and development by prohibiting new road construction but wants to encourage the multiple-use purposes of forests by allowing popular sport utility vehicles to tear apart the terrain. Fortunately for the forest products industry, the concern surrounding chip mills has not yet reached a national audience. However, since many feel that Vice President Al Gore is likely to get the Democratic nomination in 2000, and since he is already involved in the chip mill controversy, chip mills will likely be one of the next major national targets for environmentalists and other forest industry opponents.

Chapter 5

Non-Wood Substitute Materials

Introduction

In the last decade, annual housing starts numbered nearly 1.5 million. Not only have there been more homes built in the last few years than in previous decades (save for the 1960's when housing starts numbered over 2 million per year (Fedkiw 1998)), buyers are demanding larger homes than ever before. The average home today uses 17,000 board-feet of lumber and 10,000 square-feet of panel products (Building Green 1997). With unprecedented world population growth, worldwide demand for housing and the ability to consume are expected to reach staggering levels. Developing economies in former third-world nations are expected to have per capita incomes three times their current level even after adjusting for inflation. With growing populations requiring shelter and wealthier populations demanding consumer goods, there will undoubtedly be greater demands on the world's resources; development of energy supplies and energy efficiency are going to become increasingly important in the next few decades (Bowyer 1997).

Bowyer estimates that in the next 50 years, energy consumption will increase by 50 to 60% and the total number of new housing starts will be between 600 million and one billion. Critics of the United States have long said that Americans use far more resources and create more waste than anyone else on Earth. Americans use, on a per capita basis, 2.8 times as much steel, 7.4 times as much aluminum, 5.3 times as much plastic, and 3 times as much wood as the rest of the world. Bowyer paints a grim picture when he says, "assuming that the rest of the world were to follow this path, global consumption of common materials would rise 300 to 700 percent, even in the absence of population increases" (Bowyer 1997).

How the world will house the growing population while improving resource sustainability worries not only doomsday-predicting environmentalists but architects and home contractors as well. Forest products professionals say that one solution is to build homes out of engineered lumber made from plantation-grown trees. Architects are weary of the environmental friendly claims of engineered lumber. They argue that the adhesives used in composite manufacture are made from non-renewable petroleum and natural gas, and that the overall manufacturing process is more energy intensive than milling lumber (Barreneche 1994). Environmentalists say that using plantation-grown timber is unacceptable because it leads to use of “industrial forests” that are “not ecosystems [because they have] no variation in species, no diversity” (Holbrook 1995). Critics say that plantation-grown timberlands are monocultures that are no more diverse than farm fields (Malin 1995).

The perceived decline in wood quality in recent years and price fluctuations of softwood lumber cause many contractors to turn to steel for its consistent quality and price stability. New building techniques and the use of other non-wood substitutes have also made inroads into the residential housing market. There are several ways that builders can reduce or eliminate wood in home construction. The use of stressed skin panels for walls, plastic or composite lumber in non-load bearing situations, and alternate materials such as brick, stone, and concrete are often emphasized as suitable substitutes for wood. Even archaic materials like adobe, rammed earth, and straw bales are mentioned as viable alternatives to wood frame construction (Building Green 1997). In an industry where margins are thin and competition is fierce, homebuilders are likely to switch from wood to other materials even if the price difference is small (Power 1999).

The biggest obstacle to using steel framing was for a long time the lack of standardized building codes for steel construction (Barreneche 1994).

Many designers and architects automatically choose non-wood materials for construction because they automatically assume that any material that does not deplete forest resources is environmentally preferable. One reason that the steel industry does not have the bad public image that the lumber industry has is that mines are geographically limited. People can easily see clearcuts as they drive across or fly over the United States; mines are often in isolated, desolate parts of the country if not completely underground. Logging and timber companies have received much of the bad publicity because they are so much more visible than mining (Malin 1995).

Incorrect assumptions about the environmental benefit of substitute materials and bad publicity of the forest products industry will have a profound impact on the building products industry. Fluctuating lumber prices, perceived resource availability problems, homeowners' increasing willingness to pay a premium for "green" construction, and builders' increasing familiarity with alternative building techniques and materials threaten wood's dominance in the building products market. Exacerbating this problem is the marketing influence of companies that make non-wood substitute materials and, to this author's dismay, the shocking complacency of the forest products industry.

Steel

Steel has a 65% market share of one-story commercial and industrial buildings (Bagsarian 1998) and is, more than any other industry, attempting to penetrate markets traditionally dominated by wood. In 1994, the steel industry said it was going to capture

25% of the new residential building market by 1997 (Munk 1994). By 1998, they achieved less than 1% of the residential market (Longo 1998; Woker 1998). Today the industry says that by 2002, steel framing will be in 25% of all new homes (Bagsarian 1998; Woker 1998). Let there be no doubt: *the steel industry is declaring war on wood.*

Engineering researcher and architectural consultant Steven Winter is an advocate of using steel in residential construction and says that, “The steel industry must think long term and be willing to break into the residential market in any way possible... The industry also must first attack easy targets for steel such as the West Coast where earthquakes have spurred demand for a more durable construction material” (Woker 1998). The steel industry is sparing no expense in its effort to penetrate the residential housing market. In 1997, the American Iron and Steel Institute won a victory when it persuaded the Council of American Building Officials (CABO) to approve standards for steel frames in single family homes. The steel industry has also taken steps to improve the environmental and public image of steel. The Steel Alliance was formed in 1997 as a conglomerate of 25 North American steel producers, and 44 steel suppliers, processors, and trade organizations. The Steel Alliance has launched a five-year, \$100 million program to convince the public of the benefits of steel-framed homes (Bagsarian 1998).

Meant to alter the perception of the steel industry as polluting and outdated, the Steel Alliance was formed to promote steel’s recyclability, safety, and durability (Ritt 1998). The Steel Alliance began a meager advertising campaign in 1997 but augmented its efforts two years later with one 30-second television ad, five 15-second television ads, and eight radio ads meant to “shake things up.” The Austin, Texas-based advertising

agency GSD&M hired award-winning director Gerard de Thame to produce the television ads. The ads, which can be accessed from the Steel Alliance's Web site at http://www.thenewsteel.com/ads/ads_main.html, rely on a story-telling format rather than the traditional "hard sell." The advertisements promote steel's strength, recyclability, fire resistance, and claimed "advantages" over other products, particularly wood.

In Blacksburg, I have seen only one of the aforementioned Steel Alliance television ads. I did, however, see several during brief visits to the Washington, D.C., metropolitan area. Few people that I spoke to have seen any of the ads, making me believe that the advertisements are intentionally aired in highly populated urban areas. If the notion that the Steel Alliance intentionally focuses its advertisements on populated urban areas is correct, then one can infer that they believe that affluent middle and upper classes white collar workers are more likely to change their purchasing habits based on perceived product quality. This, too, should be the market segment on which the forest products industry focuses its efforts to amend the misperceptions that most consumers have about wood.

The Steel Alliance, to paraphrase Steven Winter, has as its goal: *attack easy targets in any way possible* (Bagsarian 1998). Apparently this includes outright lies and deception. The Steel Alliance has an advantage: since people already have a poor perception of wood and there is currently no one in the forest products industry to challenge steel's claims, citizens are likely to accept steel industry rhetoric at face value. Consider the following "facts" from the Steel Alliance's Web site:

- 1) steel has a higher strength to weight ratio than any other construction material,
- 2) fasteners used to build steel frame homes create much stronger connections than fasteners used in a wood home,

- 3) steel is more ductile than wood, allowing it to bend and absorb the stresses of an earthquake instead of cracking and breaking like wood,
- 4) steel framing is subject to higher design standards as a result of more rigorous testing required by building codes,
- 5) steel doesn't burn, so a steel frame house can better withstand a fire,
- 6) building with steel preserves natural resources and creates less waste,
- 7) because it is galvanized, steel will not rust, and
- 8) *unlike wood, steel can be easily cut* to custom lengths and widths so builders can design any type of home (emphasis added).

Let's look at each of these "facts" individually. Wood, especially softwood species, has tensile strength and a higher strength-to-weight ratio than steel.

While nailed connections in wood construction tend to loosen as wood dries, the strength of connections varies from house to house depending on connection design and technique, duration of load, and history of the structure.

Wood is an elastic material with high impact strength that will resist high frequency (short duration) load; whereas wood during an earthquake will absorb shock and bounce back to its original shape if not stressed beyond its elastic limit, steel will bend or buckle, causing permanent deformation.

One of the early arguments that architects have about using steel is the lack of accepted uniform structural standards governing light-gauge steel construction (Barreneche 1994). Only recently has a building code organization (CABO) approved standards for using steel frames in single family homes (Bagsarian 1998).

It is true that steel doesn't burn; however, it melts and buckles without warning in a fire (Holbrook 1995).

There are many extensive studies, some of which are discussed in a later section, that corroborate that wood is the building materials that best preserves natural resources (Koch 1992).

Steel that retains its galvanized coating will not rust. But the galvanizing process relies on a non-renewable resource (zinc) and once the protective layer on a galvanized stud is damaged (when a stud is cut to length or a conduit is made for wires or plumbing, for example), moisture will inevitably set in and initiate the corrosion process. Steel studs are so thin that once rust sets in, they will corrode all the way through. There will not be the "sacrificial layer" of corrosion that forms on thick steel I-beams.

The notion that steel is easier to cut than wood is so ludicrous that it does not merit comment. With today's design software, connectors, and truss schemes, only cost and imagination limit home designs. If there were a situation where solid lumber would not suffice, there is an array of engineered wood products that could be used in lieu of steel.

Proponents of using steel in residential construction claim that fluctuating lumber prices are one reason builders like using steel studs. Knowing that the price of steel studs remains relatively constant gives contractors security in bidding projects; they know they will not lose their profit margin if lumber prices increase before a job is complete and they are contractually bound by a construction estimate. Steel advocates claim that steel is therefore more cost effective than wood in residential construction, though there seems to be some confusion on this matter. Some steel advocates claim that even though steel

studs are more expensive than solid lumber, labor costs are reduced because steel studs take less time to install than their wooden counterparts (Woker 1998). Other advocates of using steel in residential construction (Bagsarian 1998) and architects (Barreneche 1994) claim that even though *steel studs are less expensive* than solid lumber, *labor costs are greater* because design engineers must be called in to verify specifications and subcontractors who are unfamiliar with steel frame homes charge more for their services. The steel industry should conduct more research before they make claims about cost effectiveness.

Plastic

The plastic lumber industry is also trying to gain a share of the residential housing market, as well as other markets that have traditionally been dominated by wood. Plastic has made tremendous headway into the packaging and materials handling industries and offers advantages over other materials. Plastic has gained a market share in industrial fabrication because its flexibility allows it to be formed into complex shapes, thus reducing the number of individual parts that must be made. This leads to a reduced material use and lower production costs (Buwalda and Halpin 1998).

Plastic is gaining a large share of the pallet segment of the forest products industry; 30 billion pounds of plastic go into pallet production each year (Vlosky 1999). Increasing the use of plastic lumber is the next logical step for the plastic industry to focus its effort. While plastic lumber was not widely available ten years ago, it is readily available today for both commercial and residential applications. Though most plastic lumber is not yet strong enough for structural applications, some firms are trying to

market carbon fiber reinforced plastic lumber for load-bearing use. Not long ago, use of plastic lumber was limited to landscape timbers and playground equipment. Today viable markets for plastic lumber include railroad ties, decks, docks, marine pilings, and road signs. The plastic industry is actively pushing for adoption of ASTM codes for reinforced plastic in structural situations (Buwalda and Halpin 1998). Undoubtedly they will then try to penetrate the residential construction market currently dominated by softwood lumber.

The plastic industry cites many environmental and practical advantages over wood. One is the fact that most plastic lumber is made from 100% post-consumer use plastic. Plastic wood is impervious to water and doesn't need to be stained, sealed, or painted. It doesn't suffer the water-related problems associated with wood: splits, rot, checks, and dimensional change. Plastic lumber resists decay from ultraviolet light and is unaffected by termites and decay fungi (Vlosky 1999).

Energy Requirements of Wood versus Non-Wood Materials

Competing industries claim that their products are more environmentally friendly than wood because steel and plastic can be completely recycled. Wood suffers a clear disadvantage because although it, too, can be completely recycled, wood is most often reengineered only into lower quality products. It is true that pallets are refurbished into high quality flooring and recovered timbers can be cut into lumber or sliced into veneer. Most of the time, though, recycled wood is converted into chips for paper production or recycled paper is used to manufacture lower quality paper. Since recycled fiber retains a lower level of its original strength, virgin fiber must always be included when using pulp

from a recycled source. Steel and plastic, however, can be melted down and entirely reused. This is where the steel and plastic industries can claim 100% recyclability, but in terms of breaking down the original substance into *some* form of a new one, wood, too, can claim 100% recyclability.

The plastic and steel industries claim that their respective products are less damaging to the environment than wood. They fail to mention, however, that when considering the environmental impact of one material over another, people must consider other factors besides the source of the material. They must also take into account such things as pollution generated during the manufacturing process, transportation and construction costs, impacts on building efficiency, and disposal or recycling options after the structure's useful life (Adams 1994; Malin 1995).

Critics of wood maintain that using wood as a construction material is more damaging to the environment than using steel or plastic construction materials. The truth is that because of its lighter weight and greater energy efficiency, wood is the best and most environmentally sound building material. While wood accounts for 50% of the industrial raw materials used in the world, it uses only 4% of the energy required for conversion into useful products (Temperate Forest Foundation 1999; Legg 1999). Research repeatedly shows that wood is the most energy efficient resource when all factors are considered (Koch 1992).

The manufacture and transport of one ton of 8-foot long 2x4 wooden studs requires 2.91 million British thermal units (Btu) of energy. If the studs were made of steel instead of wood, the energy requirement to make and transport them would rocket to 26.67 million Btu. One ton of plywood siding requires 6 million Btu as opposed to the

32 million Btu required for an equal amount of aluminum siding. On average, it requires 38 million more Btu to replace lumber products with substitute materials. It requires 97 and 100 additional Btu, respectively, to replace plywood and MDF-based products with substitute materials (Koch 1992). Koch predicts that replacing wooden building materials with ones from nonrenewable resources (such as steel, aluminum, brick, plastic, and concrete) would cause greater annual oil consumption (up to 141 million barrels) and additional carbon dioxide emissions into the atmosphere (up to 62 tons per year).

The cost of all processes from extraction to final product manufacture is less for wood than it is for substitute materials. It requires 70 times more energy to produce one ton of aluminum than to manufacture one ton of lumber. Steel and concrete require 17 times and three times, respectively, the energy required to make an equivalent amount of lumber (Adams 1994).

The general population is largely unaware of the extent and significance of paper recycling in the United States; this is an area that the forest products industry should broaden its exposure. Steel advocates claim that steel is the most widely and easily recycled material. They say that builders should choose steel studs over wooden studs for home construction because steel studs are 100% recyclable (Building Green 1997; Steel Alliance 1999). The Alliance and other steel advocates conveniently forget to mention that the recycled content of light-gauge steel used to make steel studs for residential construction is relatively low, about 20% (Barreneche 1994; Malin 1995).

“Unless society stops consuming building materials, wood is by far the most environmentally friendly material on Earth” (Adams 1994). The forest products industry needs to change the perception that America is running out of trees and that wood is not a

modern or environmentally sound building material. The industry needs to take an active part in communicating to the public the benefits of using wood as a building material. As architect Nadav Malin says, “the misguided, knee-jerk reaction to avoid wood products” should not keep builders from using wood as long as supplies are available from verifiably well managed forests (Malin 1995).

Chapter 6

Impact on the Forest Products Industry

Introduction

Since people already have a poor perception of wood as a modern and environmentally sound building material, they are likely to support government efforts to limit logging in National Forests and curtail further chip mill construction in the name of environmental protection. They will also readily accept the attacks on wood made by environmentalists and manufacturers of substitute materials. The forest products industry will face stiff competition from substitute materials and lose market share as builders and customers become more familiar with alternative building materials and techniques. As the federal government further restricts domestic logging and consumers shy away from products supposedly made from Northwestern, old-growth trees, more manufacturers will get their lumber and component parts from overseas. This will have a detrimental effect on the world's timber supplies as most exporting countries have less stringent environmental laws than the United States and overseas landowners forgo sustainable forestry initiatives to make a quick profit. This may accelerate tropical deforestation and give environmental groups more evidence of the "evils" of the timber trade.

The Surge of Green Building

Environmental concern and the limited supply of old-growth timber has spurred a move to "build green." Architects, homebuilders, and building products retailers are looking to use and promote environmentally sound building materials and techniques. Green marketing of wood products is definitely not a passing fad and will affect most aspects of how the forest products industry conducts its business (Irland 1993).

The average single-family home in the United States requires 17,000 board-feet of lumber and 10,000 square-feet of panel products (Building Green 1997; Tylczak 1999). Advocates say that Americans can reduce wood use in home construction by 30% through recycling, reduction, and substitution with non-wood products (Building Green 1997). As builders and homeowners look to substitute materials for framing, steel and plastic lumber are the most viable alternatives. Steel missed its 1997 target of gaining 25% of the residential framing market (actual market share is about 1%), but the number of steel framed homes has increased in recent years and the steel industry is determined to gain its desired 25% market share by 2002 (Bagsarian 1998; Woker 1998). In 1992, 450 homes were built with steel frames; a year later, the number rocketed to 14,000 (Munk 1994; Barreneche 1994). By 1997, the number of steel-framed homes built was up to 95,000, accounting for 6% of the residential housing market (Bagsarian 1998). In 1994, the director of research for the National Association of Home Builders estimated that the wood industry will lose five to 15% of its market share to other residential building materials each year (Munk 1994).

There is little doubt that steel has captured an increasing amount of market share from wood due to people's poor perception of wood quality and environmental sustainability. It is also due in large part to Steel Alliance efforts to promote steel to the general public. In March 1997, a Steel Alliance tracking poll determined that 64% of people preferred wood as a building material, compared to 24% for concrete and brick and 8% for steel. After the Steel Alliance aired television and radio commercials that extolled the benefits of steel for six months, favorable impressions of wood among the

public fell 13 points to 51%. Favorable perceptions of concrete and brick rose to 30% and steel to 10% as a result, says the Alliance, of these ads (Bagsarian 1998).

Composite materials are also making tremendous inroads in the residential housing market. In 1984 there were hardly any laminated veneer lumber (LVL) and wooden I-joist plants in the United States. By 1999 there were nearly 60 throughout North America. LVL and I-joist production increased 300% and 900%, respectively, between 1990 and 1998 (Tylczak 1999). Though purely plastic lumber and composite wood-plastic lumber are unsuitable in load-bearing situations, architects are using these materials in interior walls where structural support is not an issue (Malin 1995). A few companies are manufacturing on an experimental basis carbon fiber reinforced plastic lumber with suitable strength for structural applications; however, material costs for widespread use are currently prohibitive (Barreneche 1994).

America's Growing Reliance on Wood Imports

Another result of the early 1990's "owl legislation" on the American forest products industry is an increased reliance on imports. Imports from Chile, New Zealand, and China have significantly increased in recent years. New Zealand forest products firms are aggressively targeting American markets (Flynn 1994). Foreign firms have had great success exporting radiata pine to the United States. The species is in high demand in the Pacific Northwest because it is a viable substitute for, is more evenly colored, and grows faster than, Ponderosa pine (Read 1998). Imports of New Zealand radiata pine increased from 3.4 million board feet (mmbf) in 1991 to 42.4 mmbf in 1993. Imports of radiata pine from Chile exhibited similar growth trends, though Chilean firms focus more

on exporting processed lumber than firms from New Zealand that export whole logs (Flynn 1994). Imports from China have also experienced a similar increase. Imports of logs, lumber, and finished wood products from China grew from \$310 million in 1993 to \$1.3 billion in 1997. China has joined Canada, Malaysia, and Indonesia in supplying the United States with 25% of its furniture (Bibeau 1999).

Forest products professionals expect to see an increasing U.S. reliance on imported logs, chips, and value-added finished goods (Read 1998; Miller Freeman, Inc. 1998). The forest products trade deficit is so grave that it is now a national concern. In October of 1999, Lyn Withey, Vice President of Public Affairs for International Paper, testified before Congress to try to get forest products trade barriers included on the agenda for World Trade Organization (WTO) industrial trade debate Seattle, Washington. During his testimony, Withey said:

For too many years, the U.S. market has provided an open door to our foreign competitors, while U.S. producers have had to scale high tariff walls and other barriers to compete in foreign markets. We have seen the global trade balance in the forest products sector decline since the conclusion of the Uruguay Round. In 1994, U.S. imports of forest products exceeded exports by \$2.9 billion; in 1998, the trade deficit in the forest products sector more than tripled to \$9.4 billion. In the solid wood segment, U.S. exports have dropped 20 percent since 1994, while foreign imports have increased 33 percent. *We believe the WTO meeting represents the last opportunity to level the competitive field for our products* (emphasis added).

(Capitol Hill Hearing 1999)

In November, much to the dismay of the forest products industry and Congressional members from both parties, President Clinton withdrew the U.S. from WTO negotiations to liberalize trade restrictions on forest products. Clinton was concerned about the environmental impact that increased logging might have on the

world's forests and did not want the United States to bear responsibility for their destruction (CongressDaily 1999).

Chapter 7

Forest Products Industry's Response to Outside Threats: Ambivalent Sloth

Introduction

Ambivalent sloth refers to what this author sees as a weak-willed, indecisive, and sluggish effort by the forest products industry to counter myths perpetuated by environmentalists and other detractors of wood. Certain companies within the industry make an admirable effort to create public awareness about wood's environmental attributes and the industry's efforts to ensure environmental quality. There is, however, no single voice that promotes wood for the sake of the entire forest products industry. While there are trade associations that conduct research for and promote certain segments of the forest products industry, there is not one that stands as a solitary advocate for the industry as a whole. The steel industry has the Steel Alliance and the plastic industry has the Plastics Council, but there is no counterpart for the forest products industry to promote it or pursue its objectives. As discussed in a later section, some in the industry call for the creation of such an organization, but so far their pleas have gone unheard.

Certifying forest products (informing consumers in a credible way that the wood used to make the product comes from a sustainably managed forest) is touted as the best way to improve the public image of forest products companies and to help consumers not feel guilty about using wood. Certification does, however, have critics and shortcomings of its own. Others believe that educating the consumer (i.e.- the public) about the environmental benefits of wood, how much wood the average person uses in his or her daily life, and the plethora of everyday household products that contain wood derivatives is essential to quelling environmental and competitor rhetoric. If the public actually *knew* how much it depends on wood and wood products, and if it realized the progress the forest products industry has made in resource utilization and energy efficiency, then,

hopefully, Congress, environmentalists, and the general public would all stop bickering and start addressing more serious world issues.

This section of the report will address steps taken by parts of the forest products industry to improve its public image and disseminate positive information about wood. Unfortunately, only a few firms are taking the initiative to invest in public education and consumer awareness. Unless more firms engage in such programs or the entire industry coordinates its public awareness efforts, the number of consumers that fully realize wood's attributes will remain miniscule.

Certification

Many forest products industry professionals say that certification is the easiest and most cost effective way of guaranteeing to the public the sustainability of forest resources. The premise behind certification is that an independent, non-governmental party will ensure that a forest products company is sustainably harvesting its timber and is adhering to environmental laws. Certification is meant to reduce the negative impact of commercial forestry by rewarding responsible forest management and maximizing the positive impact that forestry has on local communities (Donovan 1999).

One of the reasons some forest products firms support certification is the belief that it will lessen the disproportionate degree to which the industry is held responsible for tropical deforestation. Other firms believe that certification will improve the public's image of wood and will help avoid loss of market share to competing materials. Bearing the cost of certification is an issue that many manufacturers do not want to bear or pass on to the consumer. A few optimists, however, believe that cost will not be an issue

because certification will give businesses a competitive advantage through price and source flexibility (Brown and Hammel 1994).

There has been a shift in recent years from certifying the sustainability of *forests* to certifying the practices of *forest managers* as a means ensuring the sustainability of the forest resource. Certification advocates hope that this will accelerate the certification process throughout the industry. As of 1999, only one-third of one percent (.33%) of the forested land area in America is certified. Certifying managers and forests is difficult and expensive, but certification will likely broaden the exposure of, and accelerate market demand for, certified forest products (Wilson and Malin 1997).

There are many critics of certification, and even its advocates say that it has its shortcomings. Standardization among different certifying agencies in the U.S. and abroad has been a problem. Chain-of-custody certification (certifying the environmental impact of a product through its entire manufacturing process, not just its initial source) is difficult, costly, and controversial. Foresters differ on their definition of responsible and irresponsible forest management, and the difference between certified and uncertified lumber is not recognizable at the retail yard. There is even concern about the all-or-nothing aspect of certification. Many in the industry say that for practical manufacturing and production reasons, it is impossible to verify the 100% certified content of products and that the level should be lowered to 70% (Wilson and Malin 1997).

Critics say certification is not necessary because it is based on the assumption that all of the world's forests are poorly managed and that it is the fault of the timber industry. Another assumption that certifying agencies make is that consumers *want* certified products and *will pay more* for them. Some say that demand for certified wood products

is limited to a few buyers who are trying to feel better about themselves or to producers who are using certification as a marketing gimmick to charge a premium for their product (Waffle 1994).

Realizing the Need to do More

Professionals in the forest products industry *seem* to know what needs to be done to improve their image (educate the consumer), but no one is taking the initiative to do anything. The forest products industry needs to make a coordinated, organized effort to promote the benefits of wood and to dispel the myths that environmentalists and manufacturers of substitute materials perpetuate. Many forest products industry professionals say that we have missed the opportunity to convince the public of the benefits of using wood. More and more in the industry are realizing that if they do not do something soon, then it really will be too late to preserve wood's market share in the American economy.

An editorial in the fall, 1999, issue of the *Engineered Wood Journal* attacks the forest products industry for its sloth and emphasizes the point that the industry needs to take immediate action. The editorial, in part, says:

After decades of losing ground in the environmental debate we are finally making an effort to take the moral high ground by...admitting to the mistakes and publicizing the new paradigm. [The] reality in the lumber industry has been our gross unwillingness to spend money to promote the general use of wood fiber. Competing industries have taken away significant market share and have very expensive ad campaigns in place to make sure that the framing component of our business alone drops to just 75%.

(Canton 1999)

Other industry professionals recognize that the public has negative perceptions of wood, that there is a need to gain the public's trust, and that the industry must fight against those who work to make people feel guilty about using wood. Robert F. Legg is the president and CEO of the Temperate Forest Foundation, an organization that works to improve public understanding of the issues surrounding natural resources. He recognizes that negative perceptions of wood influence laws and regulations and adversely affect the costs, profitability, and competitiveness that forest products firms realize in the marketplace. Legg says, "the only antidote for negative perceptions is education" and recommends a two-prong strategy of a massive promotion campaign and industry-sponsored long-term education (Legg 1999).

Long before I started writing this paper, I recognized the need for a large, organized public relations (i.e.- promotion) campaign like the plastic and steel industries have. It was my feeling then, and it is my feeling now, that the forest products industry needs such a campaign. Legg recommends a two-prong approach to improve public perceptions of the forest products industry: a massive promotional campaign in conjunction with an industry-sponsored educational program. The massive promotional campaign is missing, but many industry-sponsored educational programs already exist.

Forest Products Industry Efforts to Educate the Public

Georgia-Pacific, Boise Cascade, Mead Paper, International Paper, and Weyerhaeuser all have programs that fund educational projects in grade schools and give grants to local communities. Several companies' Web sites have pages that contain lists of community educational programs that they fund and/or bits of information about wood

and the forest products industry for public examination. The Internet can be a valuable tool for disseminating accurate information about the forest products industry. Jim Bowyer recommends using the web for distance education purposes to teach wood technology to secondary school and college students as well as forest industry professionals (Massey et al. 1997).

Georgia-Pacific has the most comprehensive educational program of any forest products company in their Educational in Nature program. G-P has sites on their home page dedicated to specific needs. These include a Web page that contains a glossary of forestry terms, one that has tools for teachers, another with downloadable PDF files for teachers that explain the Educational in Nature program, and others that have educational activities designed especially for children. There is even a page that briefly illustrates why wood is strongest in the longitudinal direction and how grain direction varies in different layers of plywood (Georgia Pacific 1999).

The American Forest and Paper Association (AF&PA), a Washington, D.C.-based trade association for the forest products industry, started airing a television advertisement in the D.C.-metropolitan area in October 1999. Similar to the Steel Alliance ads, it is not clear whether or not this solitary advertisement is meant as a response to challenges posed by the steel industry. The ad asks viewers if they know who came up with the internationally recognized “chasing arrows” recycling symbol (the Mobius loop) that appears on many consumer items that are made from paper, cardboard, glass, and plastic. The symbol was offered, the ad later says, as a submission to a contest sponsored by the Container Corporation of America, a forerunner to the Smurfit-Stone Container Corporation, in recognition of the first Earth Day in April 1970. AF&PA is proud to

display the Mobius loop in recognition of the paper industry's dedication to recycling and the symbol's 30th birthday. A print ad running in conjunction with the television ad highlights the paper industry's development of the symbol and dedication to recycling (Barnes 1999). The AF&PA ads rely on the irony that a symbol that is so often associated by the public with glass and plastic was created by a paper company for Earth Day. I view this solitary advertisement as a small first step towards what the forest products industry should do to improve its public image and counter the distortions perpetuated by environmentalists and competing industries.

Chapter 8

Recommendation and Conclusion

Recommendation

The forest products industry should start a *centralized and coordinated* public relations and advertising campaign targeted towards consumers across the country in all age groups. As important as it is to target consumers at the peak or in the beginning of their earning potential, it is *essential* to target people who are not yet users of consumer goods (i.e.- children and adolescents). They are the people who will one day enter the work force and make the economic and political decisions that guide how the government and the forest products industry operate. They are the ones who are at an influential age and who will decide if wood continues to be the world's most widely used natural resource or if trees become monuments in a giant outdoor museum.

Individual forest products companies should be commended for initiating local educational programs in the communities where they operate. Educating consumers is the key to attracting their business; helping them *understand* the benefits of wood and the detriments of substitute materials is the key to making them loyal users of wood and responsible “green” citizens of the Earth. This is best accomplished not by *saying* wood is an environmentally sustainable material but by *actively publicizing* wood's attributes and exposing the lies and half-truths of its adversaries.

An apparent dilemma to implementing such a program is determining *where* the money will come from. The real difficulty is not determining *if* there is enough money to fund such a program but *how* funds will be evenly allocated and *who* will coordinate the effort. There is plenty of money in the forest products industry to go around, and some of it should be used to improve the industry's stature with the public. Last year unnamed companies within the industry spent \$3.5 million to defeat an Oregon bill that would have

outlawed clearcutting and chemical use on private land. Willamette Industries spent \$5 million last year to repair roads that were damaged by erosion, improve fish passage through culverts, and put logs in streams to create pools for salmon spawning. Northwest forest products companies will coordinate themselves to spend \$130 million over the next ten years to reduce the risk that logging roads pose to salmon (Bernton and Brinckman 1998). If the industry can spend millions of dollars in Oregon lobbying legislators against clearcutting bans and complying with environmental laws meant to protect fish, then the industry can certainly afford a coordinated national effort to improve its public image. The challenge is getting the industry to come together and take decisive action *before* it loses any more ground to environmentalists and other detractors of wood.

Conclusion

The public has a poor perception not only of wood as a viable and sustainable building material but also of the forest products industry as responsible caretakers of the country's forests. Few people realize the range of everyday consumer products that are manufactured from wood or the extent of paper recycling in the United States. The public underestimates the percentage of forested area in America compared to colonial days and does not realize that forests cover a larger area today than they did in 1920. The recycling movement is definitely influential, as most of the public has bought the myth that recycling paper will help save tropical rainforests in South America and domestic old-growth forests. Unfortunately, a third of the public believes that using plastic, concrete, and metal building materials is less damaging to the environment than using ones made from wood. The public does not realize that non-wood materials require

many more times the energy and water to manufacture and transport than do wood products. They probably do not consider, or they choose to ignore, the fact that unlike any substitute material, wood is renewable. Unlike coal, iron ore, and petroleum, trees grow back.

Environmental groups and manufacturers of substitute materials take advantage of wood's poor public image to further their political and economic goals. If the public already has a preconceived notion of wood as not being modern, high in quality, or environmentally sound, then it makes the jobs of wood's detractors much easier. If legislators buy the environmental hype, then more of the nation's forests will be set off limits to the forest products industry and America will have to rely on imports more than it already does. Americans concerned with the Earth's environmental welfare may be doing more overall harm than good as American firms turn to countries with less stringent environmental laws to acquire the wood fiber that they need.

The forest products industry seems to know what it needs to do to improve its public image but so far is unwilling to make a coordinated national effort to promote wood use in America. An industry that generates revenue in excess of \$250 billion each year in the United States should have the ability to fund a promotional campaign to maintain its place in the world economy. Until they decide to work together to promote the interests of the entire forest products industry, individual companies will continue to lose market share to competitors.

REFERENCES

- Adams, Larry. 1994. *Comparing wood to Other Materials: THERE IS NO COMPARISON*. Wood & Wood Products. September: p. 94.
- Baden, John A. and Andrew C. St. Lawrence. 1997. *A Century of Forest Service Ineptitude*. The Freeman. October: pp. 607-609.
- Bagsarian, Tom. 1998. *Building the Market for Steel Framing*. New Steel. January: pp. 36-48.
- Barber, Lionel. 1991. *The "Ungreening" of America.* Financial Times of London. September: pp. 38-39.
- Barnes, Gordon. 1999. *Forest Products Industry Celebrates Long-Time Commitment to Recycling*. Media Release. <http://205.197.9.134/news/PressRelease/recyc_ad_rel.html> October 24.
- Barreneche, Raul A. 1994. *Framing Alternatives*. Architecture. October: pp. 103-104.
- Bass, Rick. 1996. *A Walk in the Woods Shows that "Salvage Logging" is Just Another Way to Cut and Run*. Sierra. July/August: pp. 28-30.
- Bernton, Hal and Jonathan Brinckman. 1998. *Timber Industry Struggles to Maintain Harvests*. The Oregonian. September 27.
- Bibeau, Albert J. 1999. *To all wood products manufacturers: this is your wake-up call!* Wood & Wood Products. 104 (1): 69.
- Boise-Cascade Corporation. 1999. Web site. <<http://www.bc.org/>> November 11.
- Bowman, Rex. 1999. *Chip Mill Plans Creating Concern in Southwest VA*. Richmond Times Dispatch. February 7: p. C1.
- Bowyer, Jim L. 1997. *Housing a Growing Population in the 21st Century*. Montana Business Quarterly. 35 (4): 2-9.
- Bowyer, Jim L. 1995. *Fact vs. Perception*. Forest Products Journal. 45 (11/12): 17-24.
- Brown, Greg and Chuck Harris. *Professional Foresters and the Land Ethic Revisited*. Journal of Forestry. January: pp. 4-11.
- Brown, Linda and Debbie Hammel. 1994. *Green Certification of Wood: Implications for the Woodworking Industry*. Wood & Wood Products. September: pp. 96-100.

- Building Green*. 1997. *Amicus Journal*. 19 (1): 52.
- Buwalda, Tim and Barbara Halpin. 1999. *What's New with Plastic Lumber?* Resource Recycling Online. <http://www.plasticsresource.com/reading_room/articles/plastic_lumber.html> October 24.
- Canton, Eric P. 1999. *THE PRO-WOOD INITIATIVE- On the side of right!* Engineered Wood Journal. Fall: p. 40.
- Capitol Hill Hearing. 1999. *Testimony of Lyn Withey, Vice President of Public Affairs, International Paper, before the Senate Finance Committee, International Trade WTO Agricultural Negotiating Objective*. October 8.
- CongressDaily. 1999. *Letter Opposes Withdrawal from WTO Logging Talks*. National Journal's CongressDaily Online. <<http://web.lexis-nexis.com/congcomp/b698c2b6f7857bd9ecc3320&taggedDocs>> November 10.
- Cosgrove, Sean and Bernie Zaleha. 1999. *Logging Our Legacy*. *Sierra*. 84 (4): 63-66.
- Consumer Reports. 1992. *Are you a "green" consumer?* 57 (11): 704-712.
- CQ Researcher. 1998. *Shifting Attitudes*. *Congressional Quarterly*. 8 (39): 923.
- Dialogue. 1995. *Dialogue on Environmental Apocalypse*. *The Futurist*. May/June: pp. 27-28.
- DiNunzio, Mario R. 1994. *Theodore Roosevelt: an American Mind*. St. Martin's Press. New York.
- Dogwood Alliance. 1999. Web Site. <<http://www.dogwoodalliance.org/>> November 11.
- Dombeck, Mike. 1999. *Chief and Director's Breakfast*. Chief of the Forest Service, in a speech delivered to the Society of American Foresters Convention, Portland, Oregon. September 14.
- Donovan, Richard. 1999. SmartWood web-site. <<http://www.smartwood.org/>> February 3.
- Earth First! 1999. Web site. <<http://www.envirolink.org/ef/>> October 21.
- Elvin, John. 1999. *Dam-Busters*. *Insight*. 15 (37): 16.
- Evans-Pritchard, Ambrose. 1996. *Focus on America's New Outlaws*. *Sunday Telegraph*. April 7: 21.

- Federal News Service. 1999. *Testimony of Scott E. Schlarbaum, Associate Professor of Forest Genetics, University of Tennessee, before the House Committee on Resources*. In the News. November 3.
- Fedkiw, John. 1998. Managing Multiple Uses on National Forests. USDA Forest Service Report FS-628. U.S. Department of Agriculture. Washington, D.C.
- Flynn, Bob. 1994. *Filling the wood gap: US buyers look worldwide*. Wood Technology. September/October: 34-35.
- Foote, Jennifer. 1990. *Trying to Take Back the Planet*. February 5: pp. 24-25.
- Georges, John A. 1993. *The Environment and the Paper Industry*. Chairman and CEO of International Paper, in a speech delivered to the Chamber of Commerce, Greenwich, Connecticut. October 20.
- Georgia Pacific. 1999. Web site. <<http://www.gp.com>> November 12.
- Goldman, Patti A. and Kristen L. Boyles. 1997. *Forsaking the Rule of Law: the 1995 Logging Without Laws Rider and Its Legacy*. Environmental Law, Northwestern School of Law of Lewis & Clark College. 27 (4): 1035-1096.
- Greenpeace. 1999. Web site. <<http://www.greenpeace.org>> November 11.
- Holbrook, Dana. 1995. *Framing Techniques Change to Match Resource Quality*. Architectural Record. September: pp. 36-39.
- Hollingsworth, Jan. 1997. *Wood Chip Mills' Effect on Forest Attacked*. Tampa Tribune. April 10: p. 5.
- International Paper. 1999. Web site. <<http://www.internationalpaper.com>> November 12.
- Ireland, Lloyd C. 1993. *Wood producers face Green marketing era*. Wood Technology. 120 (2): 34.
- Jacobson, Lois. 1997. *Forest Fight*. Government Executive. 29 (10): 42-46.
- Jansen, Bart. 1999. *Western GOP Criticizes Forest Deal*. Yahoo! News. <http://dailynews.yahoo.com/h/ap/19991103/pl/forest_protection_4.html> November 10.
- Keil, Bill. 1998. *The Good and the Bad News*. Wood Based Panels International. Nexis-Lexis database. January 8.

- Koch, Peter. 1992. *Wood versus nonwood materials in U.S. residential construction*. Forest Products Journal: 42 (5): 31-42.
- Kriz, Margaret. 1998. *Fighting Over Forests*. National Journal. May 30: 1232-1236.
- Legg, Robert F. 1999. *The Greatest Story **Never** Told*. Engineered Wood Journal. Fall: 24-27.
- Little, Charles E. 1999. *The Dying of the Trees- the Pandemic in America's Forests*. An ECO BOOKS Featured Selection. <<http://www.ecobooks.com/dying.htm>> September 26.
- LiveWire. 1999. *EPA Proposes Sweeping New Water Rules*. <http://www.championpaper.com/companynews/10_99/government/government.html> November 10.
- Llanos, Miguel. 1999. *Clinton unveils historic forest plan*. MSNBC Online. <<http://www.msnbc.com/news/321254.asp?cp1=1>> October 25.
- Longo, Don. 1998. *Restoring Lumber's Mildewed Image*. National Home Center News. November 23: p. 10.
- Malin, Nadav. 1995. *Is Wood or Metal "Greener"?* Architectural Record. September: pp. 39-41.
- Massey, Joseph G., James L. Bowyer, and Stephen M. Bratkovich. 1997. *New Opportunities Abound*. Forest Products Journal. 47 (7/8): 20-26.
- Mead Paper. 1999. Web site. <<http://www.mead.com>> November 16.
- Meyer, Stephen M. 1993. *Clinton's Timber Loser: dead wood*. New Republic. 209 (5): 12-15.
- Miller Freeman, Inc. 1998. *U.S. wood products imports from Latin America up 400%*. Wood Technology. 125 (8): 14.
- Mohai, Paul and Pamela Jakes. 1996. *The Forest Service in the 1990's*. Journal of Forestry. January: pp. 31-37.
- Mullins, Brody. 1999. *Key Senate Republican Floats Interior Bill Proposal*. National Journal's CongressDaily. November 4.
- Munk, Nina. 1994. *Thank You, Spotted Owls*. Forbes. June 20: 102.
- Nash, Roderick Frazier. 1990. *American Environmentalism: Readings in Conservation History*. 3rd Edition. McGraw-Hill, Inc. New York.

- National Audubon Society. 1999. Web site. < <http://www.audubon.org/>> November 17.
- Olson, Geoff. 1998. *Tree-Ring Circus*. Environmental News Service Editorial Cartoon. <<http://ens.lycos.com/ens/features/cartoons/1998L-08-18go.html>> August 18.
- Penn Well Publishing. 1999. *Despite Perceptions, Environment is Improving*. Nexis-Lexis database. June 1.
- Polzin, Paul E. and Jim L. Bowyer. 1999. *Misperceptions About Forests and Wood Products*. Forest Products Journal. 49 (9): 37-42.
- Pope, Charles. 1999. *Members Go Out on a Limb Over National Forests*. CNN on-line. <<http://cnn.com/ALLPOLITICS/1998/04/21/cq/tree.html>> September 28, 1999.
- Power, Matthew. 1999. *Wood Framing at the Crossroads*. Builder. 22(6): 250-254.
- Public Agenda Online. <http://www.publicagenda.org/issues/pcc.cfm?issue_type=environment> September 28, 1999.
- Rainforest Action Network. 1999. Web site. < <http://www.ran.org/>> November 2.
- Ritt, Adam. 1998. *Fashioning a Better Image for Steel*. New Steel. March: pp. 50-54.
- Roberts, Paul. 1997. *The Federal Chain-Saw Massacre: Clinton's Forest Service and Clear-Cut Corruption*. Harper's. June: pp. 37-41.
- St. Clair, Jeffery. 1999. *Court of Last Resort: one judge stands between old-growth forests and the chainsaw*. In These Times. September 19: pp. 12-15.
- Satchell, Michael. 1998. *Mountain Bikers over Corporate Loggers*. Newsweek. 124 (19): 36.
- Shiffer, James Eli. 1998. *Chipping away at N.C.'s forests*. Raleigh News and Observer. November 27: p. A1.
- Sierra Club. 1999. Web site. <<http://www.sierraclub.org>> November 15.
- Smith, Dan and Lance Clark. 1994. *Hot Views on Hot Topics*. American Forests. November/December: p. 3.
- Sohn, Pam. 1998. *Mill foes appeal to Gore: broad study asked of chip industry*. Chattanooga Times. September 29: p. B1.
- Steel Alliance. 1999. Web site. < <http://www.thenewsteel.org>> October 15.

- Taylor, Rob. 1998. *Forest Fighter*. Government Executive. 30 (12): 23-26.
- Temperate Forest Foundation. 1999. Web site. <<http://www.forestinfo.org/>>
October 24.
- Tylczak, Lynn. 1999. *Two paths through the woods*. Oregon Business. 22 (2): 38-40.
- Uhlenbrock, Tom. 1998. *Which Forest do you Prefer? (This is a test)*. St. Louis Post Dispatch. May 31: p. B1.
- Vlosky, Richard. 1999. *Wood or Plastic? Can we pick a clear winner?* Wood Technology. January/February: pp. 50-52.
- Waffle, Robert. 1994. *Green Certification is Not Needed for Sustained Forestry*. Wood & Wood Products. September: 97-101.
- Wexler, Mark. 1995. *Americans Speak Out*. National Wildlife. April/May: pp. 34-37.
- Weyerhaeuser Corporation. 1999. Web site. <<http://www.weyerhaeuser.com/>>
November 15.
- Wilson, Alex and Nadav Malin. 1997. *Wood Products Certification: a progress report*. Environmental Building News. 6(10).
- Woker, Craig. 1998. *Selling Steel for Green Construction*. New Steel. May: pp. 76-79.

APPENDIX A

Virginia Tech Student Survey

For each of the following statements, please indicate whether you believe it is true or false:

- | | | |
|---|----------|----------|
| 1) "Excluding Alaska, the United States has more forested area today than in 1920." | T | F |
| 2) "The United States is a net exporter of most raw materials used by industry." | T | F |
| 3) "If U.S. consumers use more recycled paper, it will help save South American rainforests." | T | F |
| 4) "Using building products made from wood is less damaging to the environment than using products made from concrete, aluminum, steel, and plastic." | T | F |

For the following questions, please indicate the response that you believe is correct:

- 5) Is the number of trees cut down each year **greater than, less than, or equal to** the number of trees planted each year?
- 6) Has consumption of forest products in the United States **increased, decreased, or remained the same** since 1970?
- 7) What percentage of land area in the United States that was covered by forests in 1600 do forests cover today?
- A- 20%.
 - B- 50%.
 - C- 70%.
 - D- 100%.
- 8) What percentage of the total amount of paper used in the United States each year is recycled?
- A- Less than 10%.
 - B- 20-30%.
 - C- 40-50%.
 - D- 60-70%.
- 9) What percentage of paper produced each year in the United States comes from recycled paper?
- A- 5%.
 - B- 20%.
 - C- 40%.
 - D- 60%.
- 10) What has been the *primary* purpose of the U.S. Forest Service since its inception in 1905?
- A- Preserve forests to ensure a steady supply of timber for use by the wood products industry.
 - B- Preserve forests for wildlife habitat, watershed protection, and erosion prevention.
 - C- Preserve forests for hiking, hunting, tourism, and other recreational purposes.
 - D- Preserve forests by working to prevent and extinguish forest fires.
- 11) What is the *major* reason trees in South American rainforests are disappearing?
- A- They are being cut down to be used to make lumber and paper.
 - B- They are being cut down to make room for highways and growing urban areas.
 - C- They are being cut down to be used as firewood and to make room for agriculture.
 - D- They are not disappearing: it's just a bunch of media hype.
- 12) Lumber, plywood, and paper are not the only products that are manufactured out of wood. Which of the following generic products is also made from wood?
- A- Rayon for cloths and textiles.
 - B- Explosives for gun powder and rocket propellant.
 - C- Plastics for stereo speakers and football helmets.
 - D- Food additives for ice cream and citrus-flavored soda.
 - E- All of the above products are made from wood.
 - F- None of the above products are made from wood.

APPENDIX B

Tabulated Survey Results

Comparison and Summary of Survey Results: Virginia Tech survey and Jim Bowyer's research.

Correct responses are in *Italics*.

♦ = group was not asked this question

NA= not available

#1-4 true/false

Question	Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
#1-US has more forests today than in 1920.	<i>True-</i>	83	21	♦	27	♦
	<i>False-</i>	17	79		73	
#2-US is a net exporter of raw materials.	<i>True-</i>	35	49	50	50	37
	<i>False-</i>	65	51	50	50	63
#3-Recycling paper will help save rainforests.	<i>True-</i>	5	60	80	♦	51
	<i>False-</i>	95	40	20		49
#4-Wood is less damaging than non-wood materials.	<i>True-</i>	85	35	36	34	69
	<i>False-</i>	15	65	64	66	31

#5- Is the number of trees cut down each year **greater than**, **less than**, or **equal to** the number planted each year?

(Bowyer's wording: Is net harvest **greater than**, **less than**, or **equal to** net growth?)

Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
Greater than	5	68	65	34	21
Less than	90	23	NA	NA	NA
Equal to	5	9	NA	NA	NA

#6- Has consumption of forest products in the US **increased**, **decreased**, or **remained the same** since 1970?

Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
<i>Increased</i>	93	64	81	74	♦
Decreased	5	18	NA	NA	
Remained same	2	18	NA	NA	

#7- What % of land in US covered by forests in 1670 are covered by forests today?

Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
20%	23	47	76	70	42
50%	5	38			
70%	70	15	NA	NA	NA
100%	2	-	NA	NA	NA

#8- What % of total amount of paper used in US each year is recycled?

Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
<10%	22	39	◆	82	88
20-30%	45	49			
40-50%	25	11		NA	NA
60-70%	7	<1		NA	NA

#9- What % of paper made each year in US comes from recycled paper?

Response	VT survey-wood (%)	VT survey-non-wood (%)	Bowyer survey-students (%)	Bowyer survey-public (%)	Bowyer survey-industry (%)
5%	25	40	94	78	85
20%	35	44			
40%	38	12	NA	NA	NA
60%	2	4	NA	NA	NA

#10- What is *primary* purpose of US Forest Service since 1905?

Response	VT survey- wood (%)	VT survey- non-wood (%)
<i>Ensure wood supply for industry.</i>	48	21
Protect wildlife/water & prevent erosion.	32	62
Preserve hiking, tourism, & recreation.	12	13
Prevent & extinguish fire.	8	4

#11- What is *major* reason South American rainforests are disappearing?

Response	VT survey- wood (%)	VT survey- non-wood (%)
Cut down for lumber & paper.	2	33
Cut dawn for roads & cities.	2	33
<i>Cut down for firewood & farms.</i>	95	33
They're not: it's media hype.	-	1

#12- Which of the following products is made from wood?

Response	VT survey- wood (%)	VT survey- non-wood (%)
Rayon	-	19
Explosives	2	5
Plastics	-	3
Food additives	8	6
<i>All</i>	90	37
None	-	30