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TYLER ROOZEN\*

# A Case of Need: The Struggle to Protect Bigleaf Mahogany

## ABSTRACT

*Fears have arisen among many scientists that bigleaf mahogany populations throughout Central and South America are in danger of possible extinction. This article investigates the validity of those fears through analysis of the current threats to mahogany populations and offers several different strategies for protecting the species. Ultimately, little progress will be made without considerable international cooperation among several different groups including policy makers, consumers, the logging industry, and producers of mahogany merchandise. The case of bigleaf mahogany becomes increasingly important when one considers that it may prove to be the test case for sustainability in tropical lumber production.*

## INTRODUCTION

Over the last decade, bigleaf mahogany, or more specifically *swietenia macrophylla* King, has found itself embroiled in controversy. Fears have arisen among many scientists and environmental action groups that this extremely popular and profitable wood is being exploited beyond its regenerative capacity. These groups warn that this beautiful species will soon be extinct if the global community does not make concerted efforts to save this tree. The concern about mahogany goes much deeper than simply whether it will survive the coming decades. In fact, it has become the test case for sustainability in tropical lumber production. The concerns over mahogany involve a wide variety of international players. These players include multinational logging industries that cut and process the trees, governments that shape policies affecting the international trade of mahogany, producers of mahogany merchandise, and individual consumers of mahogany products. Thus, this is a global issue which cannot be solved by any single entity but rather will involve complex cooperative efforts among these players, as well as international coordination and compromise.

This article will show that swift and decisive international action is needed in order to protect bigleaf mahogany from potential extinction. First, this article will explore the history of the use and exploitation of

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mahogany throughout the centuries. Next, the question of whether mahogany is in jeopardy of extinction will be analyzed. This question will be answered by first investigating how specific biological characteristics of mahogany make it particularly susceptible to deterioration, especially in light of the trend toward increased logging. Some of these characteristics include mahogany's regeneration and regrowth patterns, its sensitivity to genetic erosion, and the difficulties involved in commercially reproducing it. Second, international factors contributing to the potential extinction of mahogany will be discussed. These factors include such things as high demand for mahogany in the international market, the inability of resource poor governments to protect the tree, and the exploitive actions of loggers and corrupt government officials.

After this analysis it will be clear that although mahogany is not under immediate threat of extinction, it will be if steps are not taken to correct the situation. To emphasize the importance of taking steps to protect mahogany, the impact of the exploitation of mahogany on the deforestation of rain forests will also be discussed. Finally, courses of action available to the international arena, which will help protect mahogany, will be considered. These include a boycott of tropical timber, the prospects and limitations of wood certification and the role that the United Nations Convention on International Trade in Endangered Species (CITES) can play in saving mahogany.

## A BRIEF HISTORY OF MAHOGANY USE AND EXPLOITATION

For centuries, humankind has been actively using mahogany for a variety of purposes. Throughout history, the unique characteristics and qualities of this wood have attracted a wide range of interested parties. Native to Central and South America, mahogany is one of the largest tropical trees in the world, growing to heights of about 70 meters.<sup>1</sup> In pre-conquest America, Mayans made dugout canoes from these massive trees. Soon thereafter, the unique characteristics of the species drew the attention of European explorers who began using it for ship repairs.<sup>2</sup>

By the sixteenth century, mahogany was being heavily exploited by several rapidly expanding countries such as Spain and Britain. It did not take long before this wood was in heavy demand abroad. In 1629 the Spanish navy established a major shipyard in what is now Veracruz,

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1. See Laura K. Snook, *Mahogany: Mining vs. Management*, 7 UNDERSTORY 1, ¶ 1 (fall/winter 1997) <<http://www.goodwood.org/goodwood/understory/new/lisnook.html>>. See also Bruce D. Rodan et al., *Mahogany Conservation: Status and Policy Initiatives*, 19 ENVIRONMENTAL CONSERVATION 331, 332-33 (1992).

2. See Snook, *supra* note 1, at ¶ 1.

Mexico.<sup>3</sup> This location permitted great access to large groves of mahogany. Britain followed suit in the 1680s by establishing a colony in present day Belize. This settlement flourished as it actively imported slaves to harvest these massive pieces of timber.<sup>4</sup>

Luckily, for several centuries technological limitations protected the bigleaf mahogany trees. Until 1800 only trees near rivers could be logged because there was no established method of transporting these cumbersome trees.<sup>5</sup> Slowly but surely, such technological constraints would fade. As the nineteenth century passed, narrow gauge railways were laid, tracking some 30 kilometers into the forest. Tractors were introduced in the 1920s that had the ability to penetrate into the jungle depths.<sup>6</sup> Finally, in the 1950s the creation of chain saws and the introduction of tractors with large rubber tires enabled loggers to go virtually anywhere they pleased.<sup>7</sup>

Thus, for several centuries technological limitations ensured the survival of the mahogany species. Today, however, virtually no constraints remain. Helicopters are used to locate the trees and roads are built into the heart of the forests. Without any constraints, loggers have had a field day. As technology increases and resources decrease, loggers from all over the world have been trying to find ways to remove secluded areas of trees. Meanwhile, many countries are too poor to protect their forests. Corruption and a lack of resources among many of the countries that currently hold a majority of remaining mahogany stocks have made it extremely difficult to enforce any protective measures whatsoever.

Mahogany continues to be a heavily demanded wood. Its exquisite color, durability, and flexible workability make it one of the most profitable woods in the world.<sup>8</sup> It is currently used for decorative woodwork, furniture, door and window frames, shingles, beams, and veneer.<sup>9</sup> If people hope to continue enjoying the unique qualities of this wood, certain steps will be necessary to ensure its survival.

### IS MAHOGANY IN DANGER OF EXTINCTION?

The answer to this question is a complex one. Conservationists claim that logging is having a profound impact upon the mahogany, which

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3. See *id.* at ¶ 2.

4. See *id.* at ¶ 3.

5. See *id.* at ¶ 4.

6. See *id.*

7. See *id.*

8. See Adalberto Verissimo et al., *Extraction of a High-Value Natural Resource in Amazonia: the Case of Mahogany*, 72 *FOREST ECOLOGY AND MANAGEMENT* 39, 40 (1995).

9. See *id.*

may lead to its extinction. Some scientists agree that the species is in severe decline.<sup>10</sup> Loggers dispute that their practices are damaging the mahogany in any long-term way. Unfortunately, very few scientific studies have attempted to gather census data on mahogany populations. Furthermore, the data that has been gathered is often incomplete and uneven in quality.<sup>11</sup>

The dispute is most prolific in Brazil and Bolivia because these two countries hold a majority of the remaining mahogany trees in the world. According to Dutch scientists, if Brazilian loggers continue to cut down mahogany at current rates, commercial stands will be exhausted in 15 years.<sup>12</sup> On the other hand, a staff member of the International Institute of Tropical Forestry estimates that loggers take less than one percent a year of the salable stock of mahogany. It is also claimed that the amount of mahogany extracted is compensated for by new growth and further, young trees could grow at 10 percent of their present rate and still keep pace with extraction.<sup>13</sup> While this dispute cannot be figured out easily, some observations can be made that show that the tree may in fact be in danger of extinction. First, natural characteristics unique to the mahogany that make it particularly susceptible to damage from logging will be reviewed. Then, actions in the international arena that are negatively affecting mahogany populations will be considered.

## NATURAL CAUSES OF MAHOGANY DECLINE AND LOGGING

### Mahogany Growth and Regeneration Patterns and Selective Logging

The regeneration characteristics of mahogany are a primary concern of scientists. Once mahogany reaches maturity it is a very durable plant. It is somewhat fire resistant and can withstand heavy winds and extensive flooding.<sup>14</sup> After years of study, botanists are beginning to understand the life cycle of this impressive tree. It appears that this species depends on natural catastrophes to survive. Occasionally, hurricanes or raging brush fires will wipe out extensive tracts of South American

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10. See Bruce D. Rodan & Faith T. Campbell, *CITES and the Sustainable Management of Swietenia macrophylla* King, 122 BOTANICAL JOURNAL OF THE LINNEAN SOCIETY 83, 83 (1996).

11. See Laura K. Snook, *Catastrophic Disturbance, Logging and the Ecology of Mahogany (Swietenia macrophylla* King): Grounds for Listing a Major Tropical Timber Species in CITES, 122 BOTANICAL JOURNAL OF THE LINNEAN SOCIETY 35, 36 (1996).

12. See John Bonner, *Battle for Brazilian Mahogany*, NEW SCIENTIST 16, Oct. 22, 1994, at 16.

13. See *id.*

14. See Rodan, *supra* note 1, at 334. See also R. E. Gullison et al., *Ecology and the Management of Mahogany in the Chimanes Forest, Beni, Bolivia*, 122 BOTANICAL JOURNAL OF THE LINNEAN SOCIETY 9, 10 (1996); Snook, *supra* note 11, at 39.

forests.<sup>15</sup> After these catastrophic events, surviving adult mahogany trees disperse their seeds. Over the first half-decade of their lives, mahogany seedlings establish themselves in these new openings of the jungle canopy.<sup>16</sup> Through this process the tenacious mahogany maintains its species and apparently has been doing so for thousands of years over a wide geographic area.

Unfortunately, the very characteristics that have enabled this tree to survive for so many years may prove to be the cause of its dwindling numbers. The above mentioned strategy for regeneration is mahogany's only self-defense. Mahogany seedlings cannot thrive under the shady conditions of the forest and are therefore at a disadvantage when having to grow under already established fauna.<sup>17</sup> Furthermore, mahogany seeds are only fertile for one rainy season.<sup>18</sup> This means that if there are no trees old enough to provide seeds each rainy season, the mahogany will not have a sustainable seed bank and cannot regenerate.

When mahogany's growth and regeneration pattern are considered in conjunction with the most prevalent manner of mahogany logging, obvious problems arise. Because clumps of mahogany trees tend to be the same age, loggers usually take entire stands of logs at once. Logging operations commonly remove 95 percent or more of all the mahoganies within a specific clump, leaving behind only those trees that are damaged or defective in some manner.<sup>19</sup> Since loggers take whole clumps of trees that are the same age, there are generally no younger trees left behind that can produce enough seed to regenerate. In addition, single clumps of mahoganies can cover vast amounts of area. By decimating the entire stand, loggers may remove the seed bank for several thousand hectares of forest.<sup>20</sup>

There is further concern. Loggers are typically uninterested in other types of trees growing around the mahogany. The reason is simple economics: mahogany fetches over twice the price of any other tropical timber. Thus, when a clump of mahogany is extracted, all the trees around it are left intact.<sup>21</sup> This is the exact opposite circumstance to the clearing brought about by the aforementioned catastrophic events. Not only do loggers remove adult, seed providing specimens, they do not create the massive opening in the forest canopy necessary for mahogany seedling

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15. See Snook, *supra* note 11, at 38.

16. See Rodan, *supra* note 1, at 334.

17. See Snook, *supra* note 11, at 39.

18. See *id.* at 39.

19. See *id.*

20. See *id.* at 40.

21. See generally Verissimo et al., *supra* note 8, at 51, 57.

success. This means that young mahoganies often fall to other jungle fauna.<sup>22</sup>

In an extensive study conducted in Brazil, these theories about mahogany regeneration were sadly confirmed. The study focused on 24 loggers specializing in mahogany processing. Scientists visited sites from which mahogany had been extracted and evaluated the sites on a variety of criteria such as the number and quality of new mahogany saplings. In the words of the researchers, "The prospects for a second mahogany harvest in our study areas does not appear to be good."<sup>23</sup> The study found that only six percent of total mahogany volume was left in place. Furthermore, no saplings were found at the sites.<sup>24</sup> Surprised by the lack of regeneration at their own study sights, these investigative scientists decided to visit four other areas where mahogany had recently been extracted. They found evidence of regeneration in 21 of 69 plots, but the mahogany treelets found were already being swallowed up by dense surrounding vegetation and the team of experts thus concluded that "it is doubtful if the mahogany treelets that we found will grow to be adult trees."<sup>25</sup>

In yet another study, scientists studied several mahogany operations around Bolivia and found similar outcomes. They found that only seven percent of logged areas showed any signs of regeneration after a 20-year period.<sup>26</sup> They also uncovered further disturbing evidence. These researchers found that loggers took all trees with a diameter of 80 cm or greater. Ironically, mahogany trees do not begin to produce massive amounts of seeds until they reach a certain age. That age typically corresponds directly with the attainment of a diameter of 80 cm.<sup>27</sup> Therefore, not only were these loggers cutting down mahogany, they were also destroying any hope of a future seed bank. Another study found no regeneration in Bolivia nine years after logging. Furthermore, personnel at Chajul biological station found that mahogany did not regenerate 50 years after selective logging practices.<sup>28</sup>

### Erosion of the Gene Pool

Not only are scientists concerned about the actual numbers of mahogany trees left in the world, but they are also worried about the

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22. See Rodan, *supra* note 1, at 334.

23. Verissimo et al., *supra* note 8, at 53.

24. See *id.*

25. *Id.* at 54.

26. See Gullison et al., *supra* note 14, at 9.

27. See *id.* at 9.

28. See Snook, *supra* note 11, at 38.

genetic quality of the remaining stock. As we have seen, loggers typically leave only those adult trees that are commercially unacceptable. Any log deemed commercially unviable typically has some type of defect. In most cases the defect is a divided trunk that makes the trees unsuitable for sawing into planks.<sup>29</sup> Conservationists and scientists fear that leaving only these trees may reduce the genetic diversity of the species.<sup>30</sup>

Recent studies by Adrian Newton of the Institute of Terrestrial Ecology have reached startling conclusions about the mahogany gene pool. In one study, Newton compared three different saplings from three different parent trees and found a strong inherited element in both the rate at which they grew and their final shape.<sup>31</sup> In fact, in subsequent experiments, Newton went so far as to say that "results presented here confirm that both growth and form traits are under significant genetic control in mahogany."<sup>32</sup> He has concluded that genes associated with superior form may be lost if healthy adult mahogany trees continue to disappear at present rates.<sup>33</sup>

Logging also tends to increase the amount of inbreeding in mahogany since the density of mature reproductive individuals is thinned out.<sup>34</sup> The major implication of such a situation is that evolutionary viability could be lost altogether. As genetic variation falls, the ability of the species to adapt to the changing environment may likewise dwindle. This might be particularly troublesome for mahogany. Mahogany is susceptible to certain shoot boring pests that attack the tree in its developing stages.<sup>35</sup> Attacks by these creatures cause severe deformation of the tree and remove all economic value. However, in naturally growing species, trees have been found that can resist these pests. Many feel that in the future, certain seeds might be genetically engineered to resist this pest.<sup>36</sup> As the potential gene pool disappears, however, so does the ability to fight off the shoot borer.

Anecdotal evidence of genetic erosion among other mahogany species also exists. *S. mahagoni*, a relative of bigleaf mahogany, was heavily

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29. See Bonner, *supra* note 12, at 17.

30. On the other hand, Julio Figuera Colon, a member of the International Institute of Tropical Forestry (a timber industry research organization), has stated that his research shows that it is a tree's environment that determines its shape, not genes. His studies, however, are unconfirmed. See Bonner, *supra* note 12. For information on scientific studies examining the possibility of genetic erosion in mahogany, see A. C. Newton et al., *Mahogany as a Genetic Resource*, 122 BOTANICAL JOURNAL OF THE LINNEAN SOCIETY 61, 61 (1996).

31. See Newton et al., *supra* note 30, at 70.

32. *Id.*

33. See *id.*

34. See *id.*

35. A. C. Newton et al., *The Mahogany Shoot Borer: Prospects for Control*, 57 FOREST ECOLOGY AND MANAGEMENT 301, 301-02 (1993).

36. See *id.* at 320.



exploited in Mexico and other Central American areas for nearly five hundred years.<sup>37</sup> Today, the quality of the remaining *S. mahagoni* trees is poor. This once prized timber is now most commonly seen in a branched or stunted form.<sup>38</sup> Trees are of such poor form that international action has been taken to protect remaining stocks of *S. Mahagoni*.<sup>39</sup> One study concluded that *S. Mahagoni* "was a prime example of extreme genetic erosion due to its past over-exploitation of the best genotypes."<sup>40</sup> Two pine species in the United States and several trees in Honduras have undergone similar transformations.<sup>41</sup> If steps are not taken to alleviate the pressures on bigleaf mahogany populations, it seems realistic that similar genetic erosion may occur in this species.

Overall, there is scientific evidence suggesting that declining numbers of bigleaf mahogany may affect the genetic variability of the species. This eroding genetic quality may lead to further problems such as an increased susceptibility to insects and poor physical form. Other species of trees have unfortunately suffered a similar fate. One possible solution for resolving this dilemma is to cultivate mahogany trees. Through cultivation loggers and scientists might be able to ensure a genetic seed bank for the future.

### The Limitations of Mahogany Cultivation

There have been attempts throughout South America to grow mahogany like any other type of cash crop, cultivating it in large tracts. However, these efforts have had quite limited success for a variety of reasons. The largest factor contributing to this is the destructive effects of shoot borer attacks on mahogany trees. Shoot borers are very successful at causing severe deformation in newly developing trees. This damage destroys all potential economic value that the affected trees may have had. One researcher has stated that the mahogany shoot borer is "one of the most economically important insect pests in tropical forestry" because it virtually prevents the mahogany from being cultivated commercially.<sup>42</sup> Currently, there are no known means to effectively control these destructive pests.<sup>43</sup>

Another reason why mahogany plantations have not been successfully developed is because, from an economical standpoint, they simply

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37. See Rodan, *supra* note 1, at 331.

38. See *id.*

39. See *id.* at 332.

40. *Id.* at 331.

41. See Newton et al., *supra* note 30, at 69.

42. Newton et al., *supra* note 35, at 319.

43. See *id.* at 301.

cannot compete with the extraction of naturally occurring stands of mahogany. Assuming that shoot borers can be controlled, mahogany is a very slow growing tree. If a tree grows at the maximum rate throughout its life, it will take about 50 years to achieve commercial size.<sup>44</sup> This is a considerable amount of time, which contributes to the economic hardship of growing and harvesting mahogany commercially. Relatively large capital investments are required, which, when combined with high interest rates typical of South and Central America,<sup>45</sup> deter the small-scale farmer from entering into this venture.<sup>46</sup> In addition to these constraints, many within the industry regard mahogany obtained from plantations as inferior to the naturally grown product.<sup>47</sup> Ventures such as agriculture and cattle ranching produce a much higher and faster rate of return on investments.<sup>48</sup> Thus, incentives to grow and harvest mahogany commercially are almost non-existent.

As discussed, there are a variety of biological factors that make mahogany populations susceptible to deterioration. Its regeneration patterns, its sensitivity to genetic erosion, and its cultivation challenges all suggest that steps should be taken to protect the mahogany. But this is only half of the story. In order to appreciate fully the pressures that mahogany populations are facing, it is necessary to consider the various international factors that are contributing to the decline of this tree.

## INTERNATIONAL CAUSES OF MAHOGANY DECLINE

### International Demand for Mahogany

Various international factors contribute to the potential extinction of mahogany. These factors include such things as high demand for mahogany in the international market, various international government policies and trading practices, and the exploitive actions of loggers and corrupt government officials. Obviously, without a market, mahogany would not be such a lucrative venture and therefore would not be subject to exploitive logging practices. Not surprisingly, the developed countries of the world are heavily responsible for mahogany consumption. In addition, mahogany fetches a considerably higher price than other tropical woods. One study found that 90 percent of tropical hardwoods sold on the

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44. See Rodan, *supra* note 1, at 334.

45. See Michael McRae, *Is Good Wood Bad For Forests?*, 275 SCIENCE 1868, 1868 (1997).

46. See John O. Browder, *Is Sustainable Tropical Timber Production Financially Viable? A Comparative Analysis of Mahogany Silviculture Among Small Farmers in the Brazilian Amazon*, 16 ECOLOGICAL ECONOMICS 147, 148 (1996).

47. See Rodan, *supra* note 1, at 334.

48. See Cheri Sugai, *Labeling Wood*, WORLD WATCH, Sept./Oct. 1996, at 29-30.

international market bring in about \$300 per cubic meter. Mahogany, on the other hand, fetches \$700 dollars a cubic meter.<sup>49</sup>

Approximately 70 to 80 percent of mahogany reaches the export market.<sup>50</sup> The largest customers of South American mahogany have traditionally been the United States and Britain. Between 1985 and 1990 these two countries each took about 40 percent of Brazilian mahogany exports.<sup>51</sup> According to one scholar on the subject, "virtually all the mahogany traded on the international markets comes from trees extracted from primary forests."<sup>52</sup> In 1986 the United States took 95 percent of its mahogany from Brazil alone.<sup>53</sup> These figures indicate that western consumption patterns are placing heightened pressures on the world's remaining stocks of naturally growing bigleaf mahogany.

Although the United States currently consumes five times more mahogany than any other nation in the world, those figures are changing.<sup>54</sup> Asia has recently been entering into the market as countries such as Japan and Malaysia have exhausted local resources in the east.<sup>55</sup> This is a fairly new development, but a potentially huge threat because of the grand scale of these foreign operations. This topic is discussed more in depth later in this article. It is clear that a considerable international demand for mahogany exists. Demand alone, however, is not necessarily the major threat to bigleaf mahogany. The inability or reluctance of countries in which the mahogany grows to protect this species is perhaps a bigger threat. It is to this dilemma that this article now turns.

### Lack of Government Control

A large problem that is troubling many conservationists in the mahogany dilemma is the lack of resources and knowledge that many South and Central American countries have in controlling logging efforts.

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49. See Verissimo et al., *supra* note 8, at 40.

50. See Snook, *supra* note 11, at 43.

51. See Rodan, *supra* note 1, at 332.

52. *Id.* at 333.

53. See Browder, *supra* note 46, at 150.

54. See *U.S. and Bolivia Move to Protect Mahogany*, ENVIROLINK NEWS SERVICES, ¶ 2 (Jan. 14, 1997) <<http://www.envirolink.org/environews/enews.html>>.

55. See Timothy M. Ito & Margaret Loftus, *Cutting and Dealing: Asian Loggers Target the World's Remaining Rain Forests*, 122-9 U.S. NEWS AND WORLD REPORT, Mar. 10, 1997, at 39. See also Clayton Jones, *Japanese Cut Back on Logging*, THE CHRISTIAN SCIENCE MONITOR, June 7, 1991, at 8; Kathryn Graven, *Environmentalists Assail Japan, Saying It is Wasting Scarce Tropical Hardwood*, THE WALL STREET JOURNAL, Mar. 19, 1990, at A14F; Jonathan Friedland & Raphael Pura, *Asian Timber Firms Set Sight on the Amazon*, THE WALL STREET JOURNAL INTERACTIVE EDITION, (Nov. 11, 1996) <[gopher://forests.org:70/00/brazil/setsite.txt](http://gopher://forests.org:70/00/brazil/setsite.txt)>.

disposal.<sup>71</sup> Dorivan Correta Bruni, the chairman of Biosfera, a Brazilian environmental group, asserts that "ninety percent of the Amazon is out of the government's control."<sup>72</sup> Gustavo Fonseca, vice president of Conservation International, has been quoted as saying "99.9 percent of the Amazon is being exploited without any control or design."<sup>73</sup> In the Chimanese forest in Bolivia, enforcement officials have one jeep to cover an area the size of Delaware.<sup>74</sup>

The integrity of several foreign governmental agencies responsible for administering applicable laws is sometimes questionable. Many times loggers go directly to government agents in order to secure illegal forest rights.<sup>75</sup> These "forest rights" transfer publicly owned government land to private logging operations that are then free to do whatever they want with the land. Only one week after the Brazilian government passed its moratorium on mahogany, the national press reported a new half-billion dollar timber project for Malaysian timber industries that included several bribes to staff members of the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA in Brazil). The scandal was denounced in a 500 page dossier prepared by the environmental group Friends of the Earth. This group studied over 10,000 documents kept in the files of IBAMA. It revealed that IBAMA staff members were receiving about \$5,000 a month from timber companies. Staff members were also charging \$20,000 to \$40,000 to issue licenses to cut down mahogany trees.<sup>76</sup>

IBAMA has had an especially poor track record. It is not uncommon for this agency to fine a company and later annul such penalties. Recently, the superintendent of IBAMA, Mato Grosso, was dismissed for his own dealings with loggers. Other areas of administration are also somewhat suspect. In June of 1994 seven officials were dismissed from Brazil's National Indian Foundation, (FUNAI). Apparently they had been involved in issuing loggers contracts on Indian lands.<sup>77</sup>

It is difficult to really know how much illegal activity goes on behind the scenes of mahogany trading. Nobody seems to have any real control over the land despite Brazilian claims that enforcement mechanisms are in place and effective. The evidence here suggests that wide arrays of deceitful tactics are employed including faulty treaties, misrepresentation, and outright lying.

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71. See William Long, *Rain Forest Boycott Questioned*, THE LOS ANGELES TIMES, Sept. 17, 1991, at E1.

72. *Id.*

73. Schemo, *supra* note 57, at ¶ 2.

74. See McRae, *supra* note 45, at 1868.

75. See Watson, *supra* note 56, at 78.

76. See *Another Scandal in the Extraction of Brazilian Mahogany*, *supra* note 65, at ¶ 2.

77. See Watson, *supra* note 56, at 78.

## The Influx of Asian Loggers

Just in case you are not convinced that mahogany may soon be endangered, one last trend needs to be discussed. Southeast Asian loggers are flooding into Central and South America in search of precious tropical woods like mahogany. This is of special concern because of the manner in which these outfits typically operate. The track records of these giant companies in other nations are poor and their extraction tactics are aggressive and efficient in their ability to take down vast amounts of trees in a short time period.<sup>78</sup> For example, Malaysia's biggest logger, Rimbunan Hijau, recently gained access to Brazilian lands. In the late 80s and early 90s this company began actively acquiring timber concessions in Papua, New Guinea. Within a matter of years the company controlled 60 percent of land concessions in that region. From 1991 to 1994 logging exports tripled in Papua, New Guinea.<sup>79</sup> In 1989 the Barnett Government Inquiry into the Timber Trade of Papua, New Guinea, reported: "It would be fair to say, of some companies, that they are now roaming the country side with the self-assurance of robber barons; bribing politicians and leaders, creating social disharmony and ignoring laws in order to gain access to the last remnants of the province's valuable timber."<sup>80</sup> These companies are a new trend in the timber industry. They are modern corporations with huge amounts of resources, including large credit lines and global telecommunications systems.<sup>81</sup> In the last few months of 1996, Asian timber groups quadrupled their holdings in the Amazon.<sup>82</sup>

What sets these multinational timber firms apart is the grand scale of their operations. In Guyana, a Malaysian company recently acquired a forest concession of about 4.2 million acres, or an area slightly larger than Connecticut.<sup>83</sup> All told, Asian firms have already purchased 30 million acres in the Amazon Basin.<sup>84</sup> Locals have reported that this number may actually be underestimated.<sup>85</sup> Typically, these loggers "unofficially" control massive tracts of land outside of their given concessions. Reports indicate that in these unrecognized holdings timber holders are especially merciless with the environment because they have no fear of being inspected.<sup>86</sup>

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78. See Barry, *supra* note 59.

79. See *id.* at ¶ 4.

80. *Id.*

81. See Friedland & Pura, *supra* note 55, at ¶ 5.

82. See *id.* at ¶ 7.

83. See Ito & Loftus, *supra* note 55, at 39.

84. See Friedland & Pura, *supra* note 55, at ¶ 7.

85. See Ito & Loftus, *supra* note 55, at 40.

86. See *id.*

Outright illegal logging patterns and corruption within government agencies have increasingly become normal occurrences.<sup>56</sup>

Reports coming out of Brazil are especially disturbing. Earlier this year, a report released by the Secretariat for Strategic Affairs of Brazil denounced the extensive theft of its hardwood by loggers. The Secretariat stated that 80 percent of wood currently being extracted from tropical forests is being done illegally,<sup>57</sup> with timber companies taking 15 to 20 times their allotted amounts of wood.<sup>58</sup> Furthermore, a recent survey of 34 logging sites in Para, Brazil, showed that none of these operations met even minimal harvest requirements as set by the International Tropic Timber Organization in its meager attempts to promote sustainable development.<sup>59</sup>

Brazil has argued that a great deal of mahogany is protected in reserves allocated to indigenous people. This is in fact true. About one third of the remaining mahogany population coincides with Indian lands.<sup>60</sup> However, more and more information is currently trickling out about logging companies invading these areas and taking wood. A study focusing on mahogany extractors in the state of Para, Brazil, found that 45 percent of mahogany harvesters interviewed admitted to extracting mahogany from Indian reservations.<sup>61</sup> Sometimes loggers make deals with the natives; other times they steal the wood outright. When loggers do make deals with native communities, they typically inflate the value of the goods they are providing and vastly understate the value of the wood that they are extracting. In one notorious case the Guajajara Indians sold 12,000 cubic meters of wood for a sack of rice.<sup>62</sup>

Indigenous people also have no way to insure that loggers are not taking more mahogany than they say they will. In 1992 the Xikrin tribe

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56. See Fiona Watson, *A View from the Forest Floor: The Impact of Logging on Indigenous Peoples in Brazil*, 122 *BOTANICAL JOURNAL OF THE LINNEAN SOCIETY* 75, 75 (1996).

57. See Dianan Jean Schemo, *To Fight Outlaws, Brazil Opens Rain Forest to Loggers*, *THE NEW YORK TIMES COMPANY*, ¶ 11 (July 21, 1997) <gopher://forests.org:70/00/brazil/openamaz.txt>.

58. See Michael Astor, *Brazil Won't Analyze Deforestation*, *ASSOCIATED PRESS*, ¶ 30 (Aug. 10, 1997) <<http://www.igc.apc.org/igc/en/hl/97081417716/h15.html>>.

59. See Glen Barry, *Asian Timber Firms Threaten The Amazon*, ¶ 7 (Feb. 14, 1997) <<http://forests.lic.wisc.edu/forests/actalert/asiaamaz.html>>. It is worth noting that the International Tropic Timber Organization (ITTO) standards are not necessarily strict in nature. The Organization is heavily controlled by tropical timber importers such as Japan, who happens to be the world's largest consumer of tropical timber, see Graven *supra* note 55, at A14F, and by exporting nations such as Brazil and Malaysia, see Rodan & Campbell, *supra* note 10, at 86. Thus, the standards set by this group are not adequate to protect the forests. Unfortunately, these standards are still rarely met.

60. See Verissimo et al., *supra* note 8, at 57.

61. See *id.*

62. See Watson, *supra* note 56, at 78.

signed a treaty that enabled a logging operation to remove 10,000 cubic meters of mahogany. Local anthropologists later estimated that the loggers took three times that amount.<sup>63</sup> According to data by the Indianist Missionary Council, mahogany was stolen from 33 indigenous areas in 1996.<sup>64</sup> Further data by this same group indicates that from 1982 to 1992 indigenous lands lost over two billion cubic meters of mahogany, equivalent to 250 truckloads a month.<sup>65</sup> Along with native reserves, there have been citings of loggers attacking biological reserves.<sup>66</sup> Between 1961 and 1991 one third of the Gurupi Forest Reserve, over 2,000 square miles of land, had been destroyed by illegal logging.<sup>67</sup>

All of these recent controversies have generated some action by Brazilian government officials. By law, timber companies must now file management plans before they can legally harvest. Many, however, are skeptical whether such requirements have any tangible results. One human rights lawyer was quoted as saying, "There is not a single sustainable management plan for the extraction of mahogany, scientifically recognized as such, being executed in Brazil. These management plans are an instrument to legalize the unsustainable extraction of timber."<sup>68</sup>

In 1996 the Brazilian National Congress placed a two-year moratorium on new mahogany logging.<sup>69</sup> Although such a decree sounds like a powerful resolution, it contains little teeth. First of all, it does not address the issue of illegal logging. Furthermore, although these forest laws may exist in theory and on paper, it seems doubtful whether Brazil's 80 environmental inspectors will be able to keep tabs on the area they are responsible for monitoring (approximately the size of Western Europe).<sup>70</sup> It will be especially difficult with the single helicopter they have at their

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63. See *id.*

64. See *Hardwood in Indigenous Areas is Coveted by International Timber Companies*, FOREST NETWORKING—A PROJECT OF ECOLOGICAL ENTERPRISES, ¶ 6 (June 23, 1997) <gopher://forests.org:70/00/brazil/covetmah.txt>. Mahogany extraction has had a wide array of troublesome effects on indigenous populations. Roads built for mahogany extraction have brought devastating foreign diseases into indigenous populations. Several armed conflicts have been documented between natives defending their lands and loggers. Natives are also introduced to alcohol and other outside substances that may destroy traditional communities. See generally Watson, *supra* note 56, for more information.

65. See *Another Scandal in the Extraction of Brazilian Mahogany*, FOREST NETWORKING—A PROJECT OF ECOLOGICAL ENTERPRISES, ¶ 2 (Apr. 7, 1996) <gopher://forests.org:70/00/brazil/morescan.txt>.

66. See Watson, *supra* note 56, at 79.

67. See *id.*

68. *Id.*

69. See *Another Scandal in the Extraction of Brazilian Mahogany*, *supra* note 65, at ¶ 1.

70. See Barry, *supra* note 59, at ¶ 7.

Asian loggers have been particularly aggressive in moving into some of the world's poorest countries with the fewest environmental regulations.<sup>87</sup> Many developing companies simply cannot turn down any opportunity to generate government income. Guyana's officials argue that they do not have much choice but to negotiate with foreign loggers if they hope to improve the living conditions of their country.<sup>88</sup> Evidence of corrupt practices among these new companies is also a concern. In July 1994 the Berjaya Group (an Asian multinational logging group) was kicked out of the Solomon Islands after attempting to bribe the country's minister of commerce.<sup>89</sup> Guyana's own commissioner of forests concedes that he is offered a bribe nearly every day by the Asian firms.<sup>90</sup>

Russell Mittermeier, president of Conservation International, has described the events as "the last great resource grab."<sup>91</sup> As local Asian timber stocks have waned, governments such as Malaysia have adopted policies encouraging loggers to go elsewhere. The International Tropical Timber Organization has found that tropical raw timber exports from the Asia-Pacific region have declined for the last three years as timber exports from Latin America have risen sharply.<sup>92</sup> Needless to say, these new multinational Asian firms represent one more threat to mahogany. It is clear that the Amazon Basin, already quite troubled in the past with corruption and illegal practices, may face its largest threats yet from these new multinational Asian firms.

Overall, there is considerable evidence that the future of bigleaf mahogany is in question. Biological factors and trends in the international trade of mahogany are both threatening the species' viability. However, there is another major concern surrounding mahogany extraction: the effects it has on deforestation in general. The next section of this article will explore this dilemma.

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87. It appears that many policies at home are driving these companies elsewhere. International scrutiny has encouraged Malaysia to adopt policies that cut down on exporting logs. Japan, the world's largest importer of wood, actually paid Malaysia to stop cutting its forests down, even though 40 percent of Malaysian wood goes to Japan. Indonesia has also begun protecting its own forests. See Graven, *supra* note 55.

88. In 1995 an Asian logging firm, Atlantic Industries, approached the Belize forestry department with a timber proposal. Belize's technical forestry consultant highly recommended turning down the offer. "I have serious doubts about the credibility of this company," he reported. "It clearly lacks professional preparation." The deal went through in spite of the official's expert opinion. See Ito & Loftus, *supra* note 55, at 40.

89. See Friedland & Pura, *supra* note 55, at ¶ 24.

90. See Ito & Loftus, *supra* note 55, at 41.

91. See Friedland and Pura, *supra* note 55, at ¶ 8.

92. See *id.* at ¶ 20.



## MAHOGANY EXTRACTION AND DEFORESTATION

In conjunction with the reasons already discussed for taking steps to protect mahogany from extinction, it is also important to weigh the ramifications such actions have on deforestation. This issue becomes especially salient when one considers that deforestation rates of Brazilian rain forests are indeed on the incline. Recently, the Brazilian National Space Research Institute released data indicating that from 1991 to 1994 the rate of deforestation steadily increased.<sup>93</sup> This data specifically states that Amazon deforestation escalated from 4,450 square miles in 1992 to nearly 6,000 square miles in 1994. This represents a 34 percent increase.<sup>94</sup> Brazil promised figures for the 1995-1996 period in late November of 1996, then in March of 1997. That release date was pushed back even further to the fall of 1997.<sup>95</sup>

But what is mahogany's role in all of this? Even the staunchest conservationist would have trouble arguing that mahogany extraction has massive direct effects on the forest. After all, timber extraction as a whole does not play that large a role in deforestation when compared to agriculture and cattle ranching. A Greenpeace sponsored study attributed 90 percent of the responsibility for forest depletion to the conversion of forest land to agricultural uses.<sup>96</sup> The process of mahogany extraction is less harmful to the surrounding forest because loggers are only after the mahogany and are not interested in extracting the surrounding trees. For example, one study, which examined the removal of 74 mahogany trees, concluded that only 4.4 percent of the surrounding forest had been damaged by activities associated with extraction such as road building and tree felling.<sup>97</sup> Another study placed the impacted area at 12.9 percent, which researchers still consider to be relatively small.<sup>98</sup> Based on this evidence, the effects of mahogany extraction on the surrounding ecosystem appear to be quite small.

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93. See Astor, *supra* note 58, at ¶ 19.

94. See *id.* at ¶ 2.

95. See *id.* The official reason for the delay is funding, but environmentalists claim the government is avoiding the issue because the results are going to be bad news. Satellite images of the Amazon region have been ready to be analyzed for some time, but the government has not yet released the funds necessary for the project to be completed. See *Id.* at ¶¶ 9-12.

96. See Robert Waffle, *Timber Logging Aids Indigenous People, Placing a Value on the Wood*, WOOD AND WOOD PRODUCTS, Mar. 1995, at 87.

97. See Gullison et al., *supra* note 14, at 113.

98. See Andrew A. Whitman, *Forest Damage Caused by Selection Logging of Mahogany in Northern Belize*, 92 FOREST ECOLOGY AND MANAGEMENT 87, 94 (1997).

However, when we consider the indirect effects of logging, the overall picture becomes much cloudier. It appears from various studies that there is a complex relationship between logging, road construction, human settlement, and deforestation. For example, the harvest of natural mahogany requires the building of roads. Roads, in turn, provide settlers with a means of getting further into the forests and establishing an agricultural lifestyle.<sup>99</sup> Roads open up areas of the jungle that would have otherwise been closed off to the public. Due to the sporadic population densities of mahogany, loggers must build many roads to enable them to harvest it. More than 3,000 kilometers of logging roads were constructed in southern Para State, Brazil, mostly for mahogany extraction.<sup>100</sup> To make matters worse, increased road building also leads to greater infiltration by people looking to settle this land. For example, in Para ranchers, settlers, and loggers obtained legal titles to these newly opened areas.<sup>101</sup>

In Para, from 1985 to 1992, colonists pushed steadily northward into the jungle 25–50 km annually along the principle logging road. At least two mahogany companies were involved in building the road.<sup>102</sup> The land bordering the first 70 km of this road had been settled by immigrants from other areas of Brazil. Most of these inhabitants were practicing destructive slash and burn agricultural methods. Forty percent of these land holdings were completely deforested in seven years. Furthermore, recent studies suggest that mahogany companies are inclined to convert part of the forest to cattle pastures after mahogany extraction.<sup>103</sup>

It would be difficult to make the argument that mahogany extraction directly destroys large chunks of forest. However, it would be equally irresponsible to argue that mahogany extraction does not contribute to deforestation in any significant manner. According to the United Nations Food and Agriculture Organization, deforestation rates are eight times higher in areas that have been logged over or opened up by logging roads than in non-logged areas.<sup>104</sup> The sad truth of the matter is that once mahogany logged areas have been opened to the public, they are converted to settlements or pastures.

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99. See Verissimo et al., *supra* note 8, at 54.

100. See *id.*

101. See *id.* at 55.

102. See *id.*

103. See *id.* at 55–57.

104. See Sugai, *supra* note 48, at 30.

## WHAT CAN BE DONE: A CASE FOR INTERNATIONAL ACTION

As indicated above, mahogany needs to be protected if it is going to survive the next few decades. The international arena needs to take steps to protect mahogany because it has the most power to effect change and because the international community is primarily responsible for the heavy demand of this precious wood. This section will consider the strengths and weaknesses of three different strategies for protecting bigleaf mahogany: boycotting tropical timber, initiating wood certification programs, and utilizing the United Nations Convention on International Trade in Endangered Species.

### Boycott

Beginning in the early 1990s, several environmental groups began campaigning for an international boycott of mahogany (Rainforest Action Network being the most vocal). The basic argument was that consumers can save the rain forest by refusing to purchase tropical timber. The message caught on in several places. Many local authorities in the United Kingdom, Germany, Holland, and the United States have passed ordinances banning the use of tropical wood in government projects.<sup>105</sup> Partially as a result of organized boycotting, the amount of mahogany imported to Britain has dropped 68 percent since 1992.<sup>106</sup>

As illustrated by the United Kingdom, boycott efforts that are strategically campaigned can clearly be productive. Boycotts are also effective because they can be relatively simple to implement. All that is needed to accomplish a boycott is the decision of individual consumers to avoid a certain product. If legislative action is also desired, lobbying efforts can be organized. Boycotts are further effective because they can be quickly started and are ideal for bringing issues to the public eye that may have previously gone unnoticed. Those boycotting mahogany feel that they have a moral imperative not to participate in a market that is contributing to both deforestation and human rights violations of indigenous persons.<sup>107</sup>

However, boycotts of tropical timber and mahogany must be applied in an extremely discriminating manner. An all out ban might have a variety of negative repercussions. If boycotts become widespread, the tactics will simply make forestry less competitive with agriculture as a profitable land use. This would likely cause more deforestation since trees

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105. See *id.* at 29-30.

106. See *U.S. and Bolivia Move to Protect Mahogany*, *supra* note 54, at ¶ 11.

107. See Chris Wille, *Buy or Boycott Tropical Hardwoods*, *AMERICAN FORESTS*, July/Aug. 1991, at 26.

would have lost much of their inherent value as a commodity. Thus, as Judson Valentim, president of the Acre State Technology Foundation stated, "the boycott may impede the purchase of those products, but it will not often impede the devastation of the forest."<sup>108</sup> Furthermore, prohibitions may undermine the few incentives that young, economically vulnerable forestry projects have to promote sustainable management. Such projects depend on capital and demand from developed countries.<sup>109</sup>

There are other reasons that a ban should be reconsidered. Ken Snyder, tropical forest coordinator for the National Audubon Society, has concluded: "the majority of tropical forests are in countries experiencing extensive economic hardships and carrying loads of debt. These governments are stuck in a short-term mind set as they desperately exploit cash crops and natural resources in order to generate foreign currency. A boycott can put additional pressure on these fragile economies, hindering conservation programs and causing the government to increase exploitation of resources."<sup>110</sup> Critics also argue that boycotts convince concerned consumers that they are contributing to a solution when in all likelihood boycotts may add to the problem. Unfortunately, this view takes away the powerful weapon of community concern and involvement.<sup>111</sup>

Well-intentioned boycotts might have other troublesome outcomes. The timber industry in several small countries is extremely labor intensive, which is a desirable trait in developing countries with high unemployment rates. A failing of the logging industry would have large-scale social impacts and would most likely force people into developing more agricultural areas in the rain forests.<sup>112</sup> For example, in the African state of Ghana, boycott efforts have already produced some noticeable effects. Industrial firms in this region are now reluctant to initiate new capital investment projects during periods of falling demand. The response of the Ghanaian timber industry has been a significant reduction in new equipment expenditures.<sup>113</sup> This lack of investment has greatly reduced the efficiency and viability of the entire Ghanaian operation. The industry directly employs 250,000 people in this small state alone, indirectly supporting several times that number.<sup>114</sup> A failing of this industry would have large-scale social impacts, and might force people into agricultural areas. Similar fears of social upheaval also seem evident in the Amazon

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108. See Long, *supra* note 71, at E6.

109. See Sugai, *supra* note 48, at 30.

110. Wille, *supra* note 107, at 60.

111. See *id.* See also Long, *supra* note 71.

112. See I. L. Eastin et al., *Tropical Timber Boycotts: Strategic Implications for the Ghanaian Timber Industry*, 43 UNASYLVA 39 (1992).

113. See *id.* at 43.

114. See *id.* at 40.

region of Brazil, which is home to some 12 million people. Economic development is badly needed to overcome widespread poverty and forest resources will inevitably become a part of that process. More information is needed concerning the relationship between poverty and deforestation before more concrete conclusions can be drawn.

In addition, there has been no communication on the part of environmental groups informing smaller, less educated logging groups about the steps that can be taken to avoid the boycott sanctions.<sup>115</sup> Distinctions need to be made between companies that seek to harvest in reasonable ways and those that harvest in exploitive ways. Because such distinctions are not made and information regarding how to properly avoid being boycotted is not disseminated, those logging companies making good faith efforts to be responsible are punished along with those companies who are irresponsible. Boycotts, therefore, might be more effective if they concentrated on especially egregious companies.

Finally, it is not clear whether boycotts will be effective in the market sense. This is a *global* issue, not a country-specific issue. Although the United States is beginning to respond, as are some countries in Europe, that does not mean that overall demand for mahogany will decline. Of particular concern is the fact that Japan was never mentioned as participating in the boycott. Measured by volume, Japan imports far more tropical wood than the United States. Although they do not currently use as much mahogany as other nations, Japan has the potential to vastly increase its overall mahogany consumption. The International Hardwood Products Association has stated that "other consuming markets [i.e. Asia] could easily and readily absorb that which would enter our country [the United States]."<sup>116</sup> Whatever strategy is ultimately decided on, it needs to include the large market of East and Southeast Asia, especially considering their sudden expansion into Latin American forests.

### Wood Certification

While boycotting mahogany seems to be effective only in limited circumstances, a newly developing process called wood certification seems to answer many of the criticisms associated with boycotts. Certification is a process in which a third party company, specializing in and licensed to certify sustainably managed timber operations, inspects and evaluates the overall logging process. For the purposes of this article, the term "sustainable" refers to actions that promote the regeneration and regrowth of the resource being extracted. Certification companies use a variety of criteria

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115. See *id.* at 42.

116. See Wille, *supra* note 107, at 60.

to evaluate and certify logging companies. Such criteria include requirements that the timber must be harvested sustainably, the health of the ecosystem must be maintained, and the social and economic needs of the community must be respected.<sup>117</sup> Based on their overall rating, companies are certified or rejected. In theory, such certification will reward timber industries for responsible conduct. Certification may also enable companies to fetch a higher price for their timber or, at the very least, be more attractive to consumers.<sup>118</sup>

To a very limited degree, certification is beginning to catch on, although almost exclusively in northern countries such as the United States and some European countries. Early in the development of wood certification, many different certifying groups were evolving at the same time. Public confusion over different certification procedures was a major hurdle. Today, however, the major certification groups have created an umbrella group called the Forest Stewardship Council. This now serves as an international body that accredits certifiers and provides a concrete set of operating rules and criteria. This body is critical because it removes fraudulent companies and makes sure that all certifiers are looking at the same sets of data and applying the same criteria. This has made it easier for everyone. Today, the two largest certifiers are Scientific Certification Systems (SCS) and Smart Wood. As wood certification grows, one can assume that the number of certifiers will as well. It will be important to maintain a certain standard for certification and develop ways to discover fraudulent certifiers.<sup>119</sup> For example, the Home Depot and Anderson Windows have begun developing certified product lines, while other companies like The Gap and Starbucks Coffee have pledged to use certified wood in their new stores.<sup>120</sup>

The certification system is particularly conducive to logging mahogany because it promotes responsible logging practices. It is hoped that certification is also likely to increase the price of mahogany and will lead to a lower demand for mahogany. Furthermore, certification is beneficial because many factors are analyzed in the certification process, including how the industry is affecting the local community. Thus, negative effects on indigenous people can be addressed. The greatest potential benefit of certification, however, is that it enables consumers to make an educated decision about mahogany purchases. If certification

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117. See David Schneider, *Good Wood*, SCIENTIFIC AMERICAN, June 1996, at 36, 38.

118. See Norman Boucher, *How to Have Your Wood and Your Forest Too*, NATIONAL WILDLIFE, Aug./Sept. 1997, at 24, 27.

119. See Richard W. Fox, *Certification: Pinpointing Good Wood*, AMERICAN FORESTS, May/June 1995, at 16-17.

120. See Boucher, *supra* note 118, at 26.

catches on, consumers will have the ability to make a difference in the future of mahogany. According to a recent Gallup poll a potential market for certified woods exists. The survey covered 24 different nations and found that 63 percent of respondents in high-income nations, 55 percent in middle income nations, and 45 percent in low income nations would be willing to pay higher prices for wood in order to protect the environment.<sup>121</sup> Whether willingness to pay higher prices translates into actual purchases of wood at higher prices is another story. This survey suggests that it is critical to give recognition to those companies that are taking steps to produce wood in a more responsible manner so that consumers may make an educated decision in their purchases. Media institutions can contribute by giving special attention to those companies that have made an effort to provide certified products.

### Limitations of Certification

Not surprisingly, wood certification is plagued by numerous side issues, especially as it pertains to mahogany. First and foremost, certification is a consumer driven endeavor. Without consumers demanding that logging practices be certified, this system cannot succeed. Although certification has been a recent hot topic of conversation in the world of timber, it has not gone much further. At the present time only .5 percent of forest products in international trade are certified.<sup>122</sup> "Market penetration?" asks George Barret, editor of the industry newspaper the Weekly Hardware Review. "There isn't any. It's minuscule."<sup>123</sup> Most timber millers are not convinced that the market for certified wood is large enough to justify the bother of handling certified logs. Furthermore, in attempting to use only certified wood, some companies have experienced economic failure.<sup>124</sup> It appears that consumer concerns have not yet changed as they heavily weigh price and traditional woods over environmental protection. One certified wood dealer asserted that when it comes to quality and price, certified wood has to compete on the same level as uncertified wood.<sup>125</sup>

Certification also involves a very complex tracking system that may cause implementation problems. Current certification systems rely on a chain-of-custody command which tracks logs from where they were cut down, to the processing mill, and finally to a manufacturer. In order for an

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121. See Sugal, *supra* note 48, at 33.

122. See Scott Berg & Rob Olszewski, *Certification and Labeling: An Industry Perspective*, JOURNAL OF FORESTRY, Apr. 1995, at 30.

123. Boucher, *supra* note 118, at 27.

124. See Daniel MacAlpine, *Certified Doors, Floors, and Furniture*, 6 UNDERSTORY 1, ¶ 12 (winter 1996) <<http://www.goodwood.org/goodwood/understory/new/macalpine.html>>.

125. See *id.* at ¶ 4.

end product to be certified, every operation the wood goes through from forest to consumer must be certified. Specific logs will have to be tagged all the way from logger, to processor, to retailer, in order to insure and verify for the consumer that the end product was made in an environmentally friendly manner. Many suggestions on the best way to do this have already been made. Some think that microchips or encrypted code tags can be used to track timber throughout its various stages of production.<sup>126</sup> It will be especially difficult when one considers the manufacturing of composite materials such as pulp and paper that could represent a mix of wood fiber from hundreds of different sources.<sup>127</sup>

Wood certification faces several of the same north-south issues that seem to plague all international environmental debates. Currently, almost all certifiers are based in the north and they do not certify for free. Costs can be significant. Rainforest Alliance charges \$10,000 for a small inspection in addition to travel costs and 25 percent of overhead costs.<sup>128</sup> An English consultant charges \$30,000 annually to inspect a 500,000-hectare concession in Guyana.<sup>129</sup> The costs begin to add up. It remains to be seen whether Latin American loggers can bear the costs of establishing sustainable practices on top of certification fees.

Northern certification companies need to make a concerted effort to involve southern countries and their respective governments in the evolving certification process. Certification will likely face a great deal of reaction from lesser-developed countries if they are not included in the program's progress. It might be interpreted as just another form of northern attempts to control the sovereignty of southern countries. Furthermore, developing some system of teaching southern foresters how to manage their logging operations in a more responsible manner is an entirely different and equally complex limitation.<sup>130</sup> If wood certification is to succeed, broad international financial redistribution among more developed and lesser-developed countries is a must. Implementation of such a process will involve the development of a considerable infrastructure. This is a much more ambitious and involved process than a boycott. It will be complex and demand a great deal of effort and coordination among those in the timber industry. Unfortunately, the idea of certification is being heavily resisted by, among others, the American timber industry

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126. See Bonner, *supra* note 12, at 17.

127. See Berg & Olszewski, *supra* note 122, at 31.

128. See Virgilio Viana, *Certification: A Southern Perspective*, 4 UNDERSTORY 3, ¶ 4 (summer 1994) <<http://www.goodwood.org/goodwood/understory/wdcert/viana.html>>.

129. *Id.*

130. *Id.* at ¶ 7.



that argues that the industry itself is the best judge of how to manage the forests.<sup>131</sup>

Limitations to certification pop up in other areas as well. In 1992 Austria attempted to regulate its imports of tropical wood through mandatory labeling of tropical products and a voluntary "quality mark" for sustainably produced timber. Malaysia and Indonesia quickly challenged the legality of such regulations under provisions of the General Agreement on Tariffs and Trade (GATT). Austria soon modified the law.<sup>132</sup> Like the boycott issue, once again we have to turn to the global question. Currently, only the United States and a few Western European countries are involved in the program. With the sluggish start that has been witnessed in this country, it is difficult to expect developing countries to embrace the program's viability. Furthermore, the potentially huge market of East Asia needs to be pulled into the picture for future certification efforts to be effective.

### Defining Sustainability

Finally, and perhaps most unsettling, wood certification is especially troublesome in the area of mahogany. How do we define sustainable when we are talking about mahogany? As we have seen, mahogany regeneration depends on massive disturbances in the jungle to give mahogany saplings a comparative advantage against other species. If this prescription is used for mahogany extraction, "sustainable development" could translate into negative effects for biodiversity and forests. Some scientists worry that we are progressing too quickly with sustainable management theories. Ted Gullison, a tropical forest ecologist, and Dick Rice of Conservation International have begun to bring up the point that humans know very little about how to manage forests sustainably. In order for this whole process to work, the science behind certification needs to be "rigorous and transparent."<sup>133</sup>

These two scientists conducted a study of a major mahogany extraction operation in the Bolivian Amazon. They concluded that if a typical sustainable management plan had been put in place in this area, "it would require so much tree-thinning to ensure the regrowth of mahoganies and other commercial trees that it would put a host of other species at risk. In winning the battle for mahoganies, we might lose the war for biodiversity."<sup>134</sup> Both researchers contend that unsustainable logging for a

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131. See Berg & Olszewski, *supra* note 122, at 31.

132. See Sugai, *supra* note 48, at 34.

133. See McRae, *supra* note 45, at 1868.

134. *Id.* at 1869.

few select species can be a more benign solution. The truth of the matter is that sustainable development and biodiversity are clearly at odds with one another. Peter Ashton, a professor at Harvard University, has stated that he cannot think of a single tropical logging operation that would qualify for certification under both timber production and biodiversity protection. Gullison argues that "we need to design management systems that better meet a biodiversity conservation objective."<sup>135</sup> It appears that more research is necessary to ensure that certification procedures, especially for mahogany, are beneficial to the overall ecosystem.

Wood certification as an overall strategy might prove to be a valuable tool in the battle for mahogany. But it is in its earliest forms and is still being shaped. Notably, consumers will have to be convinced that a little extra price is worth the stamp of environmental approval that certification brings. Currently, there is little evidence that this is happening.

#### UNITED NATIONS' CONVENTION ON INTERNATIONAL TRADE OF ENDANGERED SPECIES (CITES)

Perhaps the most promising mechanism that could be utilized in protecting bigleaf mahogany is the United Nations' Convention on International Trade in Endangered Species, otherwise known as CITES. CITES is an international agreement that came into being in 1973. It is charged with monitoring the commerce in endangered species between various states and ensuring that such trade does not threaten the health and survival of any species.<sup>136</sup> The basic framework of the convention includes three different appendices (I, II, and III) that list certain species of flora and fauna. As the appendix number lowers, the international trade of organisms in that subsequent group is more severely limited. Appendix I species are banned from international trade and may only be transported between countries with approval from CITES for purposes of education and research. Species listed in appendix II can be traded internationally only if accompanied by a CITES permit, which is designed to maintain trade at levels that will not endanger the viability of the species. Finally, the trade of species included in appendix III may be regulated by CITES member states.<sup>137</sup>

When we consider all the problems with mahogany, one's attention must immediately be brought to the language of appendix II of the CITES convention. It appears to be extremely applicable to the existing dilemmas

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135. *Id.*

136. See Samuel LaBudde, *Unraveling Creation: The Bidding War on Biodiversity*, EARTH ISLAND JOURNAL, Fall 1994, at 26.

137. See *id.* at 26.

associated with mahogany. The specific language of appendix II of the CITES treaty includes "all species which although not necessarily now threatened with extinction, may become so unless trade is subject to strict regulation in order to avoid utilization incompatible with their survival."<sup>138</sup> Clearly this listing is pertinent to mahogany. The overwhelming evidence supports the notion that mahogany is probably not "endangered," but it is threatened with such a fate.

Under appendix II, exporting countries are required to include with the species a permit that is issued in accordance with "advice from scientific authorities of the exporting state 'that such export will not be detrimental to the survival of that species' and satisfaction of management authorities of the export state that specimens were obtained legally."<sup>139</sup> Importing nations are required to enforce the prior presentation of export permits before importation.<sup>140</sup> These obligations would have immediate ramifications on the extraction of mahogany. First of all, the call to scientific authorities implies that countries exporting mahogany would be forced to develop a better information base about the populations and dynamics of this species.<sup>141</sup> Eventually, exporters would have to determine "parameters of sustainability" that would be required for permit qualifications.<sup>142</sup> Thus, it seems appropriate to suggest that countries such as Brazil would be forced to take up further research on mahogany, which is obviously in dire need.

Another important effect of this mandatory permit system is the controls it would place on illegal activities. Figures presented earlier in this article indicate just how pervasive illegal mahogany extraction is. As stock dwindles, it appears that illegal harvesting is bound to increase without some type of restraints. This could then lead to a corresponding rise in the number of conflicts between loggers and natives. Under CITES, not only would certain areas of the forest be protected, but also indigenous peoples' human rights would be bolstered.

CITES listing is critical for other reasons as well. Most notably, it would force the issue of sustainable mahogany harvest into the international arena. The CITES convention has nearly 130 signatories from all around the world. It would, in essence, provide an international framework for combating mahogany abuse. The same laws would bind the states of Asia as well as the United States and Europe. Unlike the voluntary systems

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138. See Rodan & Campbell, *supra* note 10, at 84.

139. See Snook, *supra* note 11, at 44.

140. See Rodan & Campbell, *supra* note 10, at 85.

141. See Snook, *supra* note 11, at 44.

142. See *id.* at 44.

of boycotts and wood certification, all consumers of mahogany, not just those concerned with mahogany sustainability, would be affected.

Furthermore, a CITES listing would help overcome many of the obstacles that have slowed down the creation and application of sustainable development methods as they pertain to mahogany. Under current regulations, individuals attempting to harvest this species sustainably face a competitive disadvantage and cannot compete with those who simply harvest without considering future ramifications.<sup>143</sup> Although appendix II listing will not likely resolve all these problems, it will at least encourage the framework for such changes.

### Limitations to CITES

CITES protection appears extremely desirable. Once again, however, we must look at the limitations to this solution. First and foremost is the problem of getting mahogany listed as an appendix II species. This difficult task would require two-thirds of CITES signatories to vote for inclusion in appendix II. So far this has not occurred. Bigleaf mahogany was considered for appendix II listing for the first time in 1992. The United States originally proposed it for listing. Unfortunately that proposal was withdrawn in response to pressures from the timber industry.<sup>144</sup> In 1994, the Netherlands proposed appendix II protection for this species. A majority of countries actually voted for protection, but the final tally fell six votes short of the required two-thirds majority. This vote was 50-33.<sup>145</sup> Finally, in June of 1997 yet another proposal for appendix II listing (brought by the United States and Bolivia) was again defeated. Sadly, the latest vote was considerably less optimistic than the 1994 proposal, as bigleaf mahogany tallied only 47 votes for inclusion, while 67 voted against the measure.<sup>146</sup>

It is interesting to note that Brazil abstained from the vote, but their overall stance on the initiative was obvious. Included in Brazil's CITES delegation were members of the Association of Export Timber Companies. Initial reports also suggest that Brazil's President of IBAMA, Eduardo Martins, pressured representatives of other countries to vote in favor of multinational timber companies.<sup>147</sup> This fits a pattern of voting that has pitted countries that have seen their mahogany populations decimated to

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143. See *id.*

144. See Rodan, *supra* note 1, at 331.

145. See Rodan & Campbell, *supra* note 10, at 87.

146. See *Hardwood in Indigenous Areas is Coveted by International Timber Companies*, *supra* note 64, at ¶ 2.

147. See *id.* at ¶ 3.

the point of no return (Mexico, Honduras, and Guatemala) against countries like Brazil, which still have a great deal of stock and economic interest in the mahogany trade.<sup>148</sup> It is encouraging to see Bolivia included among supporters of CITES protection mechanisms, especially considering the large numbers of trees within its borders. Overall, however, international barriers to listing mahogany in appendix II are strong. Ideologies within several governments will have to be altered in order to gain a favorable vote.

Even if appendix II listing becomes a reality, this will open the floodgates to a variety of other concerns. The biggest questions are about implementation and effectiveness. Having trees protected on paper does not answer questions concerning how countries like Brazil and Guyana will muster the resources to suddenly devise a plan to sustainably harvest mahogany. This will require the development of a considerable infrastructure, not to mention the immediate development of scientific standards characterizing "sustainable mahogany harvesting." There will have to be a significant amount of financial support and cooperation from countries such as the United States and other major importers of mahogany if CITES sanctions are to be carried out. Of special concern is ensuring that "scientific authorities" are qualified in drawing up outlines for proper management, and that they find themselves in a position to carry out such responsibilities.<sup>149</sup>

Up to this point the historical record on the effectiveness of CITES has been somewhat shaky. An evaluation of the first listings of timber species in CITES has demonstrated implementation problems. Most notably, there exists a predictable incompatibility with established timber practices and provisions of CITES.<sup>150</sup> Such problems would undoubtedly be inflamed by mahogany being placed in appendix II since it is such a highly traded commodity. One especially scathing journal reported:

[A]lthough CITES looks good on paper, indifference by member states, poor or non-existent census data on species, the almost total failure of most nations to submit non-detriment [*sic*] findings, under reporting of actual takes, and the pursuit of political and economic agendas unrelated to species protection have conspired to thwart the Convention's effectiveness . . . there is probably not one nation on Earth that can boast of its record of compliance with CITES.<sup>151</sup>

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148. See Scott Landis, *Timber Politics Storm CITES*, UNDERSTORY, ¶ 12 (summer 1995) <<http://www.goodwood.org/goodwood/understory/mahog/storm.html>>.

149. See Snook, *supra* note 11, at 45.

150. See *id.* at 44.

151. See LaBudde, *supra* note 136, at 27.

It is obvious that in order for CITES to be effective, international enforcement efforts would have to be bolstered.

Another concern is that if the incremental costs of producing and trading mahogany under CITES provisions drive the price up significantly enough to decimate consumer consumption levels, it appears that CITES could face problems similar to those discussed about boycotts. Specifically, mahogany may become so expensive to harvest that it will simply be removed to make room for more lucrative ventures such as agriculture or ranching. On the other hand, if it drives up the price of mahogany and consumers are willing to pay the additional fees, it may save mahogany by enhancing the economic viability of sustainable harvest operations. Market price alone has failed to properly estimate the costs of mahogany extraction.

Admittedly, listing mahogany in appendix II will not likely prove sufficient to answer all of the concerns inherent in mahogany extraction, but it will push the issue in an entirely new direction.

## CONCLUSION

This article has attempted to accomplish several things. First, this article has tried to illustrate that mahogany is facing serious threats. I concede that in some areas mahogany populations are quite stable, perhaps even thriving. However, one cannot ignore the facts. A host of scientific evidence suggests that mahogany may be especially susceptible to endangerment because of its unique ecological characteristics. Furthermore, the irresponsible actions of powerful international logging operations and governments of resource starved nations also threaten mahogany's existence. Deforestation concerns are also salient to the mahogany debate.

Thus, it appears justified that the international community take some action. After all, it is the desire of the international community for this beautiful wood that is fueling exploitive logging practices. There is a variety of courses of action, each with its own sets of strengths and weaknesses, which can be taken to help protect the mahogany. In reality, saving mahogany will likely require a strategic combination of consumer boycotts, wood certification programs, and the addition of mahogany to appendix II of CITES. Toward this end, boycotts can be aimed at companies with especially egregious records. Unfortunately, the certification process will take time to develop and expand. Meanwhile, however, CITES will force the issue into the international arena.

As is the case for almost all international controversies, the maintenance of bigleaf mahogany is going to require continuing and expanding research efforts. Admittedly, many issues have not yet been satisfactorily addressed specifically because information on such areas is

not extensive enough to warrant drawing conclusions. First and foremost, scientists need to continue gathering information on the interactions of the rain forest ecosystem to ensure that whatever parameters are used in defining sustainable development actually provide for such an outcome. Stephen Hubber, a 30-year veteran on the subject of forest ecology, maintains that "our level of knowledge about tropical forestry is truly bad."<sup>152</sup> He blames, among other factors, the lack of international funding in such areas.<sup>153</sup>

It would be helpful to obtain a more accurate population assessment of bigleaf mahogany trees so conservationists, scientists, and loggers could establish the extent of the immediate threat. Research that focused on controlling shoot boring pests and growing mahogany in the most efficient manner would help remove the current biological and economic constraints that are plaguing mahogany plantation efforts.<sup>154</sup> Someday it is likely that pests may be controlled and factors that improve growth rates and quality of wood will be better understood. This becomes an especially important possibility because other studies have confirmed that mahogany plantations could prove extremely profitable if one ignores current ecological constraints.<sup>155</sup> One study asserted that the amount of land area necessary to produce the total volume of mahogany exported from Brazil in 1992 would range from only 3,374 hectares to an astoundingly minuscule 932 hectares. On a 40-year rotational base, these land requirements become 134,960 and 37,280 hectares respectively. In the grand scheme of deforestation, such numbers are very small. The scientists also report that a single large company could realistically produce Brazil's entire mahogany export volume. If such a system were to succeed, the pressures on the natural forests would be alleviated. Protection of the forests might even ensue as natural mahogany stands became economically important not for their potential wood but rather their potential for providing a seed bank.<sup>156</sup> Studies such as these need to be expanded and critically evaluated. Such results illustrate that with the proper knowledge, the mahogany dilemma may eventually be resolved. Findings must be well publicized in order to gain international interest. Ultimately, further research will shed light on the realities of mahogany's future and ensure that the proper steps are being taken to maintain the species.

Thus, although we are far from taking any concrete steps in protecting mahogany, there are mechanisms in place that could solve many

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152. McRae, *supra* note 45, at 1869.

153. *See id.*

154. *See* Newton, *supra* note 35, at 320.

155. *See* Browder, *supra* note 46.

156. *See* Newton, *supra* note 30, at 70-71.

of the issues tackled in this article. Any real solution is going to require a change in the mindset among the consumers of mahogany, for they ultimately drive the market. By paying a little extra to buy products that meet certain standards of social and environmental acceptance, consumers can increase the attraction toward and viability of the sustainable harvest of mahogany. Consumers need to learn the facts while scientists and non-government organizations such as Greenpeace and The Rain Forest Action Network need to take an active role in disseminating those facts. Consumer lobbyist campaigns may also be extremely helpful in gaining CITES appendix II protection and promoting other governmental initiatives such as federal support of wood certification programs.