



Mahogany Matters:

***The U.S. Market for
Big-Leafed Mahogany
And Its Implications
For the Conservation
Of the Species***

Christopher S. Robbins



TRAFFIC
—NORTH AMERICA—

Published by TRAFFIC North America
Washington, D.C., USA

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TRAFFIC North America

October 2000

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ACKNOWLEDGMENTS

It is the author's hope that this report accurately and completely reflects the past and present role of the United States in the mahogany trade and that the findings presented herein raise provocative questions about consumer responsibility in conserving big-leafed mahogany. Factual omissions or errors may have inadvertently escaped my scrutiny, and I accept full responsibility for their inclusion in this report. Understandably, this study by TRAFFIC, the wildlife trade monitoring program of World Wildlife Fund, may prompt more questions than it actually answers, and thereby highlight the need to clarify the association between mahogany consumption abroad and the deteriorating status of the species in its natural habitat.

I appreciate profoundly the contribution of the following individuals to TRAFFIC's mahogany study: Holly Reed, TRAFFIC North America; Simon Habel, TRAFFIC North America; Don Masterson, WWF-US; Joe Domask, WWF-US; Robert Waffle; Sabri Zain, TRAFFIC International; Ximena Buitrón, TRAFFIC South America; Wendy Baer, International Wood Products Association; Chris Reed; Craig Hoover, TRAFFIC North America; Alice Taylor, WWF-US; Rodney Newman, Newman Lumber Company; Mike Kiernan, Rainforest Alliance; Jeff Hunt, Plywood and Lumber Sales, Inc.; Harry Page, Certified Wood Source; Don Thompson, Thompson Mahogany Company; and Brent McClendon, Hardwood Plywood Veneer Association.

EXECUTIVE SUMMARY

Outside of Latin America, the United States is the world's leading consumer of the American mahogany (*Swietenia* spp.) harvested in Latin America, and imports an estimated US\$56 million of American mahogany annually. Big-leafed mahogany (*Swietenia macrophylla*)—also known as genuine mahogany, caoba, mara (in Bolivia), or mogno (in Brazil)—is the most traded and coveted of the three American mahogany species. Conservationists are concerned that current harvest rates and practices may be pushing big-leafed mahogany in the same direction as Caribbean mahogany (*Swietenia mahagoni*), which was once heavily traded but is now endangered and commercially exhausted because of past overharvest.

Big-leafed mahogany matters not only to U.S. consumers with expensive taste in furniture, but also to mahogany-producing areas (range states) where the resource is critical to local economies yet increasingly threatened by intensive and illegal harvest that is driven, in part, by U.S. demand. For these reasons, the United States has a powerful economic incentive to conserve big-leafed mahogany so that the species continues to serve its ecological function as well as yield a resource upon which local industries and individuals depend. Moreover, felling mahogany trees for overseas markets may affect more than just the species. Roads specifically created for removing valuable timber species like mahogany increase the susceptibility of forests to migrating farmers who convert the forest to farmland, thereby exacerbating habitat alteration and loss of biological diversity.

TRAFFIC North America, with funding from World Wildlife Fund-US (WWF-US), reviewed the U.S. mahogany market to put into perspective for U.S. consumers the significant role of the United States in the mahogany trade. This report is intended to inform American stakeholders of the scope and scale of U.S. demand for big-leafed mahogany, the conservation implications of such demand, and various options for promoting and improving the species' conservation.

The Caribbean and, more recently, Central and South America have been supplying mahogany to international markets almost since the time of their discovery by European explorers in the late fifteenth century. Mahogany developed a favorable reputation among early European and American shipbuilders and furniture makers for its durable, highly stable, and attractive wood. Big-leafed mahogany, one of the tallest trees in Neotropical America, has a discontinuous but wide distribution from southern Mexico to the Southwestern Amazonian Moist Forests of Peru, Bolivia, and Brazil, an ecoregion recognized by WWF-US for its biological wealth and conservation importance (Roozen 1998). The World Conservation Union (IUCN) considers the species vulnerable because of declining or unsuitable habitat and a level of exploitation that may be unsustainable. The species is exported from at least 14 Latin American countries and imported by 15 countries, primarily in North America and Europe. More than 120,000 cubic meters of big-leafed mahogany from Latin America enters international trade annually, of which 76,000 cubic meters, or 60 percent of global trade, is imported by the United States. In 1998, the equivalent of an estimated 57,000 big-leafed mahogany trees was harvested and shipped to the United States to supply a robust business in mahogany furniture (Lopez 1999).

The United States consumes more timber per capita than any other country (Schwartzman and Kingston 1997). The United States is the largest importer of forest products, absorbing at least US\$13 billion annually in logs, lumber, veneer, and other products made from softwood and, to a lesser extent, hardwood tree species (FAS 1999). Big-leafed mahogany constitutes a relatively small but lucrative portion of U.S. timber trade. While the species is only one of 200 tropical hardwood tree species available in the United States, it accounts for 57 percent of U.S. imports of tropical hardwood lumber by volume and 59 percent of these imports by value (Smith, Hass, and Luppold 1995). In 1998, the United States imported mahogany from eight Latin American countries, with 95 percent of all imports originating from Brazil (45 percent), Peru (32 percent), and Bolivia (18 percent).

Approximately 60 U.S. companies in some 17 U.S. states are involved in the importation and distribution of big-leafed mahogany from Latin America, with the greatest amount imported by firms based in states east of the Mississippi River. In 1997 and 1998, North Carolina, the furniture manufacturing center of North America, accounted for most U.S. imports, absorbing 39 percent of all U.S.-bound shipments. Mississippi is the second largest importing state at 24 percent, followed by Florida (11 percent), Pennsylvania (9 percent), and Louisiana (6 percent). The U.S. furniture industry absorbs about 90 percent of the top grade mahogany lumber imported into the United States, while lower grade mahogany goes into the production of doors and architectural millwork (Smith, Hass, and Luppold 1995).

On the surface, supplies of mahogany would appear stable, keeping pace with U.S. demand. However, early signs of pressure on resource availability prompt questions about whether and when current levels of U.S. consumption of mahogany may exceed natural supply. The United States is one of the latest of several significant importers from colonial to modern times to contribute to what essentially amounts to a practice and pattern of mahogany mining in neotropical forests. During their trade history, the American mahoganies, including Caribbean and more recently big-leafed mahogany, have experienced shifts in their availability as rates and levels of extraction in one country or region, combined with other factors like habitat loss, ultimately overtake or reduce tree regeneration (Siegel and Row 1965; Lamb 1966). Historical data show that as U.S. imports of mahogany decline from one country there is usually a corresponding increase in imports from another. From 1900 to 1960, for instance, the United States imported most of its mahogany from Belize and Mexico. By 1980, however, Bolivia and Brazil had supplanted Mesoamerican countries as leading U.S. mahogany suppliers.

Lately, the list of South American countries supplying mahogany to the United States may be changing as their inventories decrease or access to the forests is restricted because of environmental concerns. For example, there has been a drop in U.S. imports from Bolivia, where restrictions are in place to reduce harvest (Worldwidewood 1999a). Conversely, Peru is paving the way to boost its mahogany production by selling to foreign companies timber concessions in the Biabo-Cordillera Azul region. Fluctuations in mahogany availability and accessibility are reflected best in trade data. From 1995 to 1998, U.S. imports from Bolivia decreased by two-thirds, while U.S. imports from Peru surged nearly fourfold. According to a TRAFFIC survey, several U.S. importers confirm that they have reacted to negative changes in their ability to obtain or maintain a supply of mahogany by importing from new source countries. Another sign of volatility is the high turnover rate in individual suppliers or exporters—12 of the 23 Bolivian companies that exported mahogany in 1996 did not export in 1999, suggesting an exporter attrition rate of more than 50 percent in four years (Bolivian CITES Authority 1999).

Other indications of increasingly tight supplies are the escalating retail prices for mahogany, which are 25 percent higher today than a decade ago, and growing reliance on substitute species like African mahogany (*Khaya* spp.) and Philippine mahogany (*Shorea* spp.) (Woodshopnews). Possibly avoiding the financial costs and public pressure associated with big-leafed mahogany, U.S. companies boosted their imports of mahogany of African origin from 4,100 cubic meters in 1991 to more than 20,000 cubic meters in 1998, the highest levels since the mid-1970s. The phenomenon of replacing increasingly costly or scarce American mahogany with more competitive timber species raises valid questions about whether, and to what degree, potentially heavier harvest of substitute tree species will alter their biological status or role in the ecosystem. Concerns about excessive levels of legal harvest are intensified by illegal exploitation, which remains a serious problem in Central and South America, particularly in Bolivia, Brazil, and Peru. Illegal trade of big-leafed mahogany underscores the enforcement and management challenges with which government officials are faced in range states (Buitrón and Mulliken 1999; Dyer 2000; *El Comercio* 1999; ITTO 2000a; Kemper 2000).

If history repeats itself, big-leafed mahogany, *S. macrophylla*, may have the same fate as its Caribbean cousin, *S. mahagoni*, which is no longer traded commercially as a result of intense

overharvest in the past. Commercial depletion of big-leafed mahogany could eliminate incentives for sustainably managing forests for high-value timber species. A concerted, long-lasting commitment by range states to mahogany conservation is central to preventing the demise of big-leafed mahogany and the displacement (or even disappearance) of local and international industries that depend on the resource. To their credit, Latin American countries have imposed logging moratoria, improved national legislation for mahogany, invested in forest certification, convened regional management workshops and, at the latest Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) meeting in April 2000, reestablished a mahogany working group that will identify conservation priorities for the species. Despite these good-faith efforts, however, illegal and unmanaged exploitation of mahogany remains a problem throughout much of Central and South America.

Range states' commitment to mahogany conservation would be aided enormously if consumer countries were to promote buyer awareness and alternatives and adopt policies that reinforce conservation initiatives in forests. After all, manufacturers and users of wood products in developed countries contribute to deleterious and dubious logging of mahogany by importing and using large volumes of the species' wood to satisfy a demand for fashionable furniture. Because consumer countries are partially responsible for mahogany's plight, they can and should participate in ways to minimize the effect of their consumption on the species. This responsibility especially belongs to the United States, which imports more mahogany than any other country. Whether passive or proactive, U.S. mahogany consumers have, along with producers and other end users, a shared economic interest in conserving this valuable resource. The following paragraphs outline various regulatory, policy, and voluntary interventions available to U.S. policy makers, companies, and consumers for improving mahogany conservation and complementing management efforts in range states.

Certification

Consumers can support mahogany conservation by buying mahogany products that carry the Forest Stewardship Council (FSC) trademark, which certifies that the wood comes from forests that are managed in accordance with FSC's internationally endorsed principles and criteria. Companies using FSC's logo on wood products have demonstrated that the timber used in their products is harvested in an ecologically and socially responsible manner from well-managed forests.

At present, only two U.S. companies are known to import big-leafed mahogany derived from forests certified by organizations accredited by FSC. However, the number of wholesalers, manufacturers, retailers, and municipalities purchasing, using, or pledging to buy FSC-certified wood is increasing in unison with concerns over forest health and management. Similarly, the number of neotropical forests certified for mahogany production remains small but is growing, with operations established in Guatemala, Honduras, and Mexico. Recent surveys and trends suggest certified wood products are gaining popularity in the United States, though more emphasis on promoting the benefits of certification among consumers is necessary for expansion of the market. Its high profile and a steady demand make mahogany a suitable species for publicizing the benefits of forest certification. The demand also makes low-impact forest management and logging economically feasible for many operations.

Consumers can take the following specific steps to support mahogany conservation through certification:

- Individuals—including homeowners, interior decorators, and architects—who are in the market for mahogany furniture should ask companies about the source of American mahogany used in furniture available in retail stores and catalogs. Where available, U.S. consumers should purchase furniture made with mahogany known to have come from well-managed forests of Central and South America. The best way to determine whether mahogany originated from responsibly managed forests is to look for the trademark of the Forest Stewardship Council (FSC), whose standards for managing forests are among the world's best. Consumers can visit the following Web

sites for more information on the availability of FSC-certified mahogany: <http://www.certifiedproducts.org/>, <http://www.ecotimber.com/>, and <http://pals4wood.com/>. Consumers can also contact Certified Wood Source (HarryPage@compuserve.com).

- U.S. importers, distributors, manufacturers, and retailers of mahogany lumber, paneling, furniture, and musical instruments can join the Certified Forest Products Council of North America—a group of businesses and individuals committed to purchasing or giving preference to FSC-certified forest products.
- Federal, state, and local governments can make a symbolic and substantive commitment to responsible forest management in Central and South America by agreeing to purchase or use mahogany from FSC-approved forests in public housing and construction projects.

CITES and Trade Reporting

The more than 150 member countries of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) can take unilateral action to protect native species within their borders from international trade by placing them on CITES Appendix III. Bolivia, Brazil, Costa Rica, and Mexico have listed their natural populations of big-leafed mahogany in Appendix III. This action has improved the regulation and record keeping on trade in mahogany exported from these countries. The discovery of a few procedural and permit discrepancies documented in this report, however, indicates that implementation of Appendix III in range states and the United States need additional attention and improvement. Range states that have yet to list their mahogany on Appendix III are urged to do so, because such an action would formalize under existing or new national legislation a government's commitment to regulate mahogany exports. Importing countries should continue to assist range states with implementation of the listing by producing training materials, monitoring shipments, and reporting permit irregularities.

Species eligible for listing in Appendix II, the next level of CITES protection, must be proposed for such a listing and approved by member countries at the Conference of Parties that meets every two and a half years. Despite the monitoring value of Appendix III, its management benefits are questionable because, unlike CITES Appendix II, the use of scientific information is not required in decisions concerning export. Repeated attempts to list big-leafed mahogany in Appendix II have failed. In some respects, Appendix II would be much less restrictive and rigorous than measures like domestic logging moratoria already in place in some countries to protect mahogany. The criteria created by the Forest Stewardship Council (FSC) and applied to the certification of well-managed forests in Guatemala, Mexico, or Brazil, or those prepared by the International Tropical Timber Organization (ITTO) to assist countries with sustainable forestry management, may actually be compatible with and satisfy criteria that would be used under Appendix II to demonstrate that exports of mahogany are not detrimental to natural populations. Regardless, an Appendix II listing for mahogany would reassure overseas consumers that the mahogany used in their furniture was exported in a sustainable and legal manner.

CITES regulates trade in mahogany saw logs, sawn wood, and veneer, exempting all other value-added products, including plywood and furniture, from its trade controls. It may become necessary to regulate under CITES a wider range of value-added mahogany products if the trend is toward a larger portion of trade in these products. At a minimum, monitoring of value-added mahogany products would close a gap in trade information and allow researchers to consider the scale and biological significance of these products in trade. Toward these ends, expanded use of the universal Harmonized System of Tariffs (HST) by creating a specific commodity code for big-leafed mahogany and its value-added products would enhance the conservation value of HST and complement CITES trade statistics. Moreover, closer compatibility between the reporting structures of HST and CITES might elucidate and explain data discrepancies. For instance, 1998 U.S. imports of big-leafed mahogany, as reported from CITES documents, were approximately 25,000 cubic meters lower than those compiled by the U.S. Department of Commerce, Bureau of the Census, using HST.

Funding of Mahogany Conservation through Import Duties

Mahogany imported into the United States from Latin America in the form of minimally processed lumber is exempt from duties that may be imposed on imports of value-added commodities like plywood and furniture. Examples of duty-free mahogany commodities include sawn wood and veneer, which together account for the majority of U.S. mahogany imports. Several trade programs or regional agreements (not specific to mahogany) reduce or waive duties for mahogany products entering the United States from Latin America and the Caribbean. These include the Generalized System of Preferences (GSP) Program, Cartagena Agreement (ANDEAN Group), Caribbean Basin Economic Recovery Act (CBERA), and the North American Free Trade Agreement (NAFTA). Each of these is different but strives to improve the economies of developing countries in Latin America and the Caribbean. The U.S. government should consider increasing import tariffs on mahogany originating from Latin America under existing trade programs or agreements. Any increases could be balanced by lowering or waiving duties levied on products of nonthreatened tree species. Monies generated from duties on imported mahogany products should be directed back to Central and South American countries for reinvestment in mahogany management efforts.

INTRODUCTION AND BACKGROUND

The debate surrounding the timber trade and its implications for forest conservation and biological diversity has been well publicized, but recently the debate over American mahogany (*Swietenia* spp.) has received equal attention. Although a centuries-old trade, American mahogany has become within the last decade a contentious environmental issue over which the conservation community and timber industry are increasingly polarized. Many conservationists view current levels of logging in American mahogany as approaching levels at which commercial extraction of timber is no longer practical or profitable, leaving the resource commercially exhausted, if not ecologically compromised. Some observers would contend that land use (or misuse) is the fundamental force driving deforestation, rather than the loggers, whose selective removal of mahogany trees can have a relatively low impact on forest health. The conservation community, however, argues that it is precisely these secondary effects of mahogany extraction, such as human colonization and conversion of forested areas to farmland following logging activity, that contribute to increasingly pervasive loss of natural forest in portions of Neotropical America. Proponents of timber trade argue that current rates of logging do not pose a threat to the species or its natural populations. Some in the industry fear that regulatory measures aimed at curbing or banning mahogany trade could even result in an economic and social backlash, eliminating jobs and removing incentives for managing mahogany forests.

The American mahoganies, neotropical hardwood trees of Central and South America and the Caribbean, comprise three species: *S. humilis*, *S. mahagoni*, and *S. macrophylla*. Big-leafed or Honduran mahogany (*S. macrophylla*), also known by its Spanish name, caoba, is the predominant and most profitable American mahogany in commercial trade today. Historically, *S. humilis* and *S. mahagoni*, which are classified as vulnerable and endangered, respectively, by the World Conservation Union (IUCN), were logged so intensively for trade that they are now practically absent from trade (Figueroa 1994). Both *S. humilis* and *S. mahagoni* are listed in Appendix II of CITES and are subject to international trade controls.

Big-leafed mahogany, prized for its exquisite color, durability, and flexible workability, is logged throughout its wide but discontinual natural range from southern Mexico through Central and South America to Bolivia and Brazil (Roozen 1998). Large portions of the Amazon Basin, including Southwestern Amazonian Moist Forests,¹ a priority ecoregion designated by World Wildlife Fund (WWF) for conservation attention, are prime habitat for big-leafed mahogany. South American countries such as Brazil, Bolivia, and Peru are the most significant producers and exporters of big-leafed mahogany; exports from Central America are comparatively lower but steady. The species is logged for domestic markets in Latin America and international trade, with most exports destined for North America and European countries.

Previous attempts at listing big-leafed mahogany in CITES Appendix II at the Conference of the Parties to CITES in 1992, 1994, and 1997 were unsuccessful. However, Bolivia, Brazil, Costa Rica, and Mexico list their populations of big-leafed mahogany in CITES Appendix III and regulate exports of the species under a system of permits. During the 10th meeting of the Conference of the Parties to CITES in June 1997, a mahogany working group was established to examine the status, management, and trade in big-leafed mahogany.

The working group convened in Brazil in June 1998 and produced two reports emphasizing the need to compile and exchange information on the sustainability of mahogany harvest, including distribution, abundance, forest inventories, and forestry practices specific to mahogany; border controls for mahogany; and identification of national and regional management measures for conserving big-leafed mahogany (Buitrón and Mulliken 1997; Buitrón and Mulliken 1999). The working

¹ WWF has identified more than 200 biologically outstanding terrestrial, freshwater, and marine ecoregions, of which 25, including the Southwestern Amazonian Moist Forests, are high-priority areas for conservation action.

group was reinstated at the 11th Conference of the Parties to CITES (COP11) and will continue to address unresolved issues such as illegal trade and improving management of mahogany forests.

Monitoring, evaluating, and improving the sustainability and legality of the mahogany trade are among TRAFFIC's top priorities. Toward this end, TRAFFIC assists countries in mahogany range states and importing countries with the implementation of the CITES Appendix III listing and the improvement of national legislation.

Much of the attention and analysis on mahogany trade and protection have focused on exporting countries in Central and South America. Yet foreign mahogany markets, which account for a large share of mahogany consumption, have been understudied in terms of their overall impact on levels of exploitation of the resource. Seeking to address this disparity, TRAFFIC North America reviewed big-leafed mahogany demand and trade in the United States to better understand the role, extent, and significance of a major mahogany market. The review culminates in this report, which is intended to increase the transparency of market demand, dynamics, and structure for big-leafed mahogany in the United States.

METHODS

This study was initiated by TRAFFIC North America, a program of WWF and IUCN, in September 1998. TRAFFIC strives to ensure that commercial trade in wild flora and fauna is carried out legally and sustainably and in a manner that is consistent with the conservation of nature. Funding for the project was granted by WWF. While the main focus of this assessment is an analysis of the U.S. mahogany trade, the report also discusses the significance of mahogany producing and exporting countries, as well as foreign markets, to improve our understanding of the scope and scale of U.S. involvement in this trade.

A review, a synthesis, and an analysis of published and unpublished information, including an Internet search, were conducted. Much of the background information on global and U.S. mahogany trade, such as markets, prices, and products, was extracted from the World Wide Web, including Web sites maintained by companies importing, manufacturing, distributing, and marketing mahogany; U.S. and foreign government agencies; intergovernmental entities; and nongovernmental organizations. Three different sets of trade data were evaluated for this review: (1) copies of CITES export permits and certificates of origin obtained under the Freedom of Information Act (FOIA) from the U.S. Fish and Wildlife Service (FWS); (2) U.S. government data available through the Web site of the Foreign Agricultural Service under the U.S. Department of Agriculture (USDA); and (3) trade reports of the U.S. International Trade Commission. Trade information was also obtained from the CITES authorities of Bolivia and Brazil, as well as World Wildlife Fund-Peru and the TRAFFIC Network, including TRAFFIC South America.

TRAFFIC carried out two surveys as part of its review of the U.S. mahogany market. U.S. importers of big-leafed mahogany were mailed self-administered questionnaires for input on their company's trade history and practices, and perceptions toward mahogany demand, availability, quality, certification, and plantation-grown lumber. Two importing companies, which account for about 25 percent of U.S. imports, were visited to explore and expand on the results of the questionnaire. TRAFFIC provided questions to the Animal and Plant Health Inspection Service (APHIS), the U.S. agency responsible for enforcing CITES listings for plants, concerning procedures for processing mahogany shipments entering and leaving the United States.

DISCUSSION

Forest Products Trade Overview

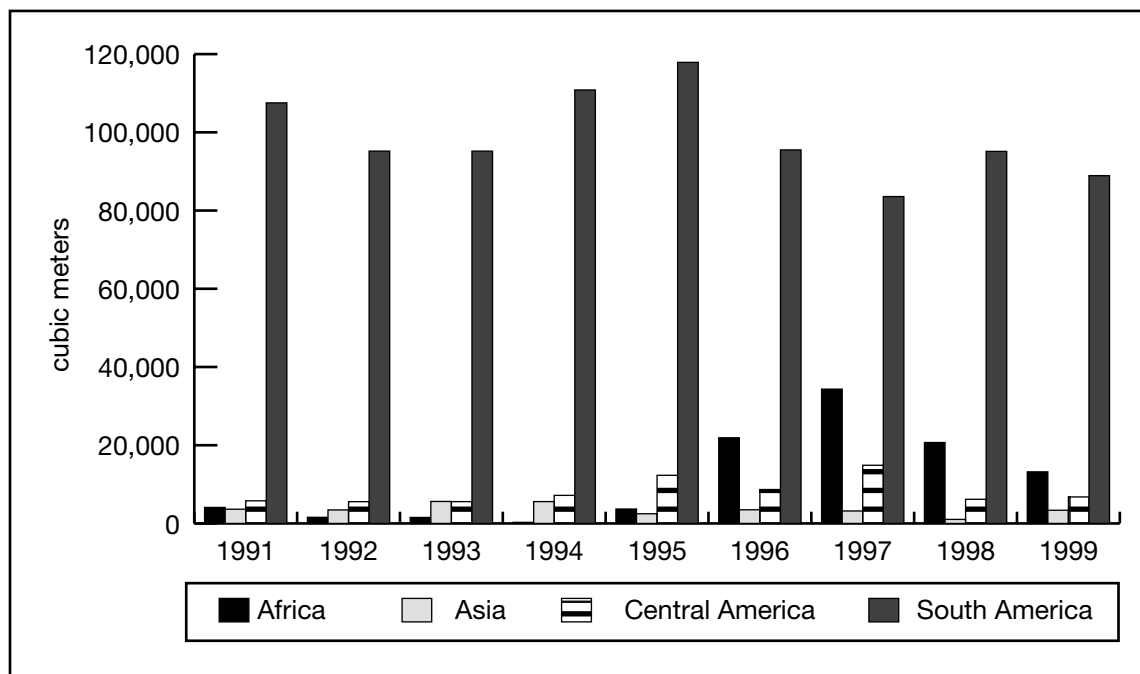
Globally, the forest products trade is valued at an annual US\$150 billion, with exports of tropical timber accounting for US\$15 billion (11 percent) of world trade (Freezailah 1998). The United States is the world's largest market for wood products, importing an estimated US\$7.5 billion to US\$13 billion annually (FAS 1999; Baer 1999). Although the United States is a leading producer of forest products, domestic logging restrictions and foreign currency devaluations have tempered U.S. timber production and exports. Compensating for increased domestic restrictions, the United States will reportedly increase its imports of timber from foreign producers, including South American countries (Schwartzman and Kingston 1997). Evidence of elevated U.S. imports is already visible. In 1998, the United States surpassed Japan as the world's largest importer of wood products (Baer 1999). Moreover, U.S. imports of wood products in virtually every commodity category from softwood logs to plywood grew from 1994 to 1998 (FAS 1999).

The preponderance of wood products consumed by the United States consists of softwood (367 million cubic meters; 75 percent), followed by hardwood (92 million cubic meters; 25 percent), of which 12 percent is imported (Ulrich 1990). Approximately US\$13.2 billion in wood products flowed into the United States in 1998, nearly 75 percent of which (US\$9.6 billion) was imported from Canada alone. Other top U.S. suppliers of wood products are the People's Republic of China, Brazil, Indonesia, and Mexico. The value and volume of U.S. imports of softwood lumber exceed that of hardwood lumber by nearly 300 percent and 4,500 percent, respectively. The share of the U.S. hardwood market that is of tropical origin is around 50 percent but at times may be as high as 95 percent (FAS 1999; Schwartzman and Kingston 1997; WIA 1993). Canada is the top supplier of hardwood lumber to the United States, which obtains 70 percent of its imported hardwood from Canadian exporters. Brazil and Peru, which together account for about 13 percent of U.S. imports of hardwood lumber, are the second (US\$59 million; 130,000 cubic meters) and third (US\$31 million; 43,000 cubic meters) top suppliers, respectively, to the United States (FAS 1999).

Mahogany Trade Overview

More than 200 species of tropical hardwoods are imported into the United States from Africa, Asia, Oceania, and Central and South America and the Caribbean (IWPG 1988). Mahogany, particularly American mahogany (*Swietenia* spp.), is considered one of most valuable and versatile tropical hardwoods (Smith, Hass, and Luppold 1995). Most U.S. imports of mahogany are made up of big-leafed mahogany (*S. macrophylla*) from South and Central America, whose annual exports to the United States average 100,000 cubic meters (CIEL 1999; Lugo 1999). Because other timber species have properties very similar to coveted *S. macrophylla*, they are often marketed as mahoganies, although geographically and taxonomically they are different trees. For instance, the United States imports African mahogany (*Khaya* spp.) from Cameroon and Ghana and through Europe, as well as Philippine mahogany (*Shorea* spp.) from Southeast and East Asia. Figure 1 depicts U.S. imports of mahogany separated into the major producing and exporting regions. Imports from Africa are primarily *Khaya*, from Asia they are largely *Shorea* and cultivated *S. macrophylla*, and from Central and South America they are wild-harvested *S. macrophylla*.

Figure 1. U.S. Mahogany Imports by Region and Volume (1991–1999)



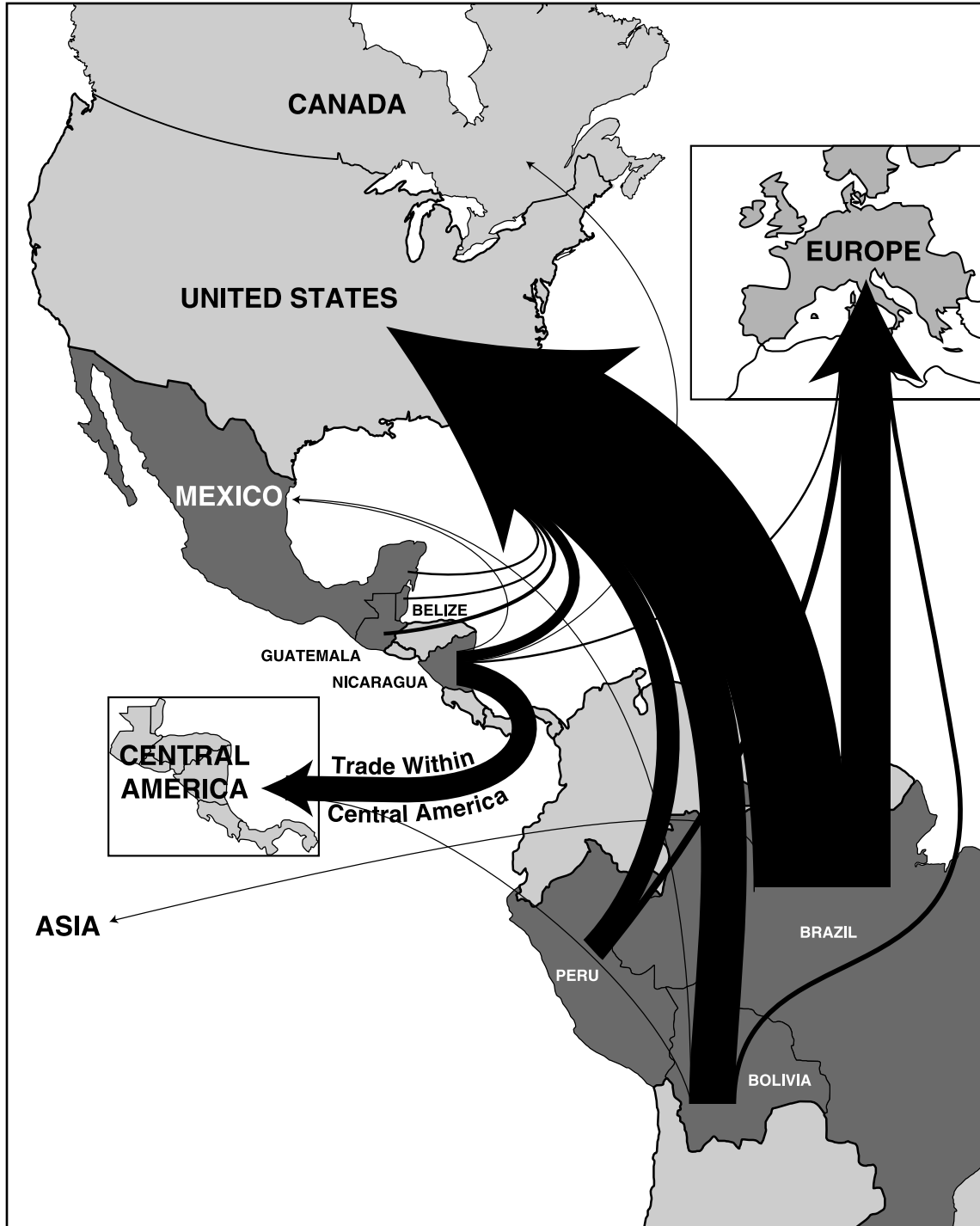
Source: U.S. Foreign Agricultural Service

Neotropical big-leafed mahogany is preferred because of its superior quality and historically abundant supply. U.S. companies appear to be diversifying their inventory by importing and promoting substitute species such as African mahogany and santos mahogany (*Myroxylon balsamum*) from Central and South America (Anon. 1999a). This substitution may be in reaction to increasing public pressure associated with big-leafed mahogany or uncertainty in supply as producer countries impose logging quotas and other protection measures. Overall, an increasing trend in U.S. consumption of African mahogany occurred in the 1990s; imports from 1991 to 1997 grew from 4,100 cubic meters to more than 34,000 cubic meters, an increase of 730 percent. Despite a decrease in U.S. imports to 20,692 and 13,188 cubic meters in 1998 and 1999, respectively, commercial demand for African mahogany remains relatively strong in the U.S. marketplace (Woodshopnews, date unknown).

American mahogany comprises three species: *S. humilis*, *S. mahagoni*, and *S. macrophylla*. The former two species, which are listed in CITES Appendix II, are practically nonexistent in trade today because of centuries of intensive exploitation that reduced wild populations to the point at which extraction is no longer commercially viable. Limited commercial trade has occurred in *S. humilis* and *S. mahagoni* since 1990. Dominating international trade is *S. macrophylla*, which is exported from Central and South America to markets in North America, the Caribbean, and Europe (figure 2).

Historically, the dominant markets for big-leafed mahogany have been Europe and North America, though a larger share of this trade today is destined for the latter. In 1998, North America and Europe accounted for 97 percent of big-leafed mahogany imports, with the United States absorbing 75,500 cubic meters, or 60 percent, of this trade and France 31,600 cubic meters, or 25 percent. Other countries importing big-leafed mahogany in 1998 included Canada (6,000 m³), Great Britain (4,167 m³), the Dominican Republic (3,226 m³), Spain (2,178 m³), Germany (708 m³), the Netherlands (511 m³), and several other European and Latin American/Caribbean countries (figure 3).

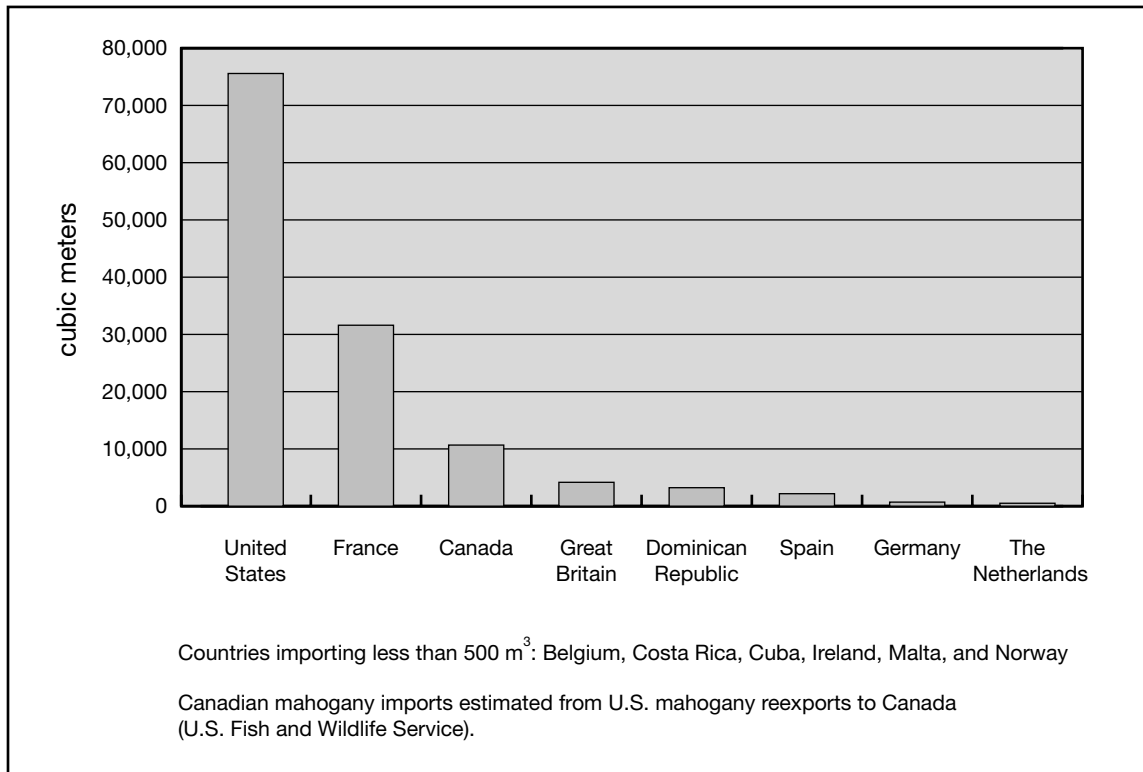
Figure 2. Flow of Big-Leafed Mahogany from Latin America to Importers (1997)



Source: World Conservation Monitoring Centre (WCMC)

The primary producer and exporter of big-leafed mahogany is South America. Brazil was the leading South American exporter in 1998, supplying global markets with approximately 75,000 cubic meters, or 64 percent, of the big-leafed mahogany entering international trade. Peru and Bolivia were the second and third largest exporters in 1998, representing an estimated 20,700 cubic meters and 19,300 cubic meters, respectively, of big-leafed mahogany produced for overseas markets. Central American countries, including Belize, Guatemala, Honduras, Nicaragua, and Panama, accounted for only 2 percent of the big-leafed mahogany traded internationally in 1998.

Figure 3. Big-Leafed Mahogany Trade by Top Importing Countries (1998)



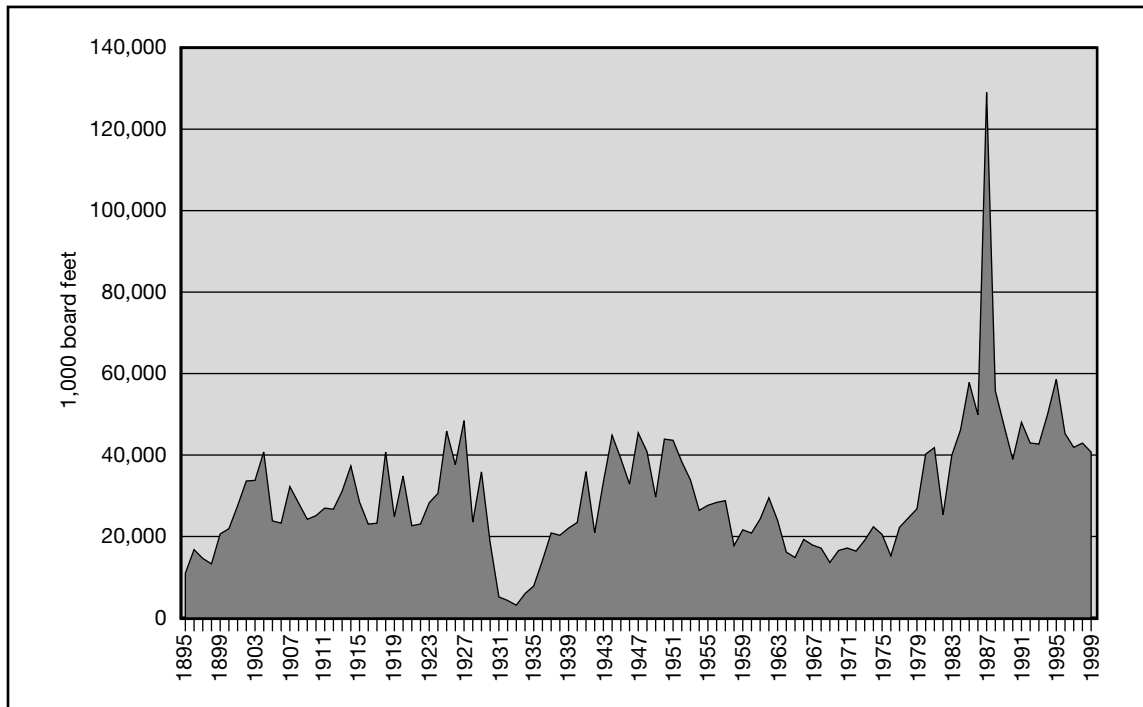
Source: World Conservation Monitoring Centre (WCMC)

The United States is a long-standing importer of American mahogany, formerly obtaining most of its mahogany from the Caribbean and Central America, but more recently from South America. The U.S. mahogany market can be characterized as steady, with occasional fluctuations in response to economic stagnation or growth (figure 4). Despite a substantial rise in imports from the 1970s to 1990s, the latest data suggest U.S. imports may be leveling off or declining slightly, but remaining high because of a robust economy and strong demand.

Government trade initiatives (or restrictions) of producer countries can influence the behavior of mahogany exporters and causes upward or downward shifts in supply. For example, in 1987, the Brazilian government sought to expand its economic reach to global markets by offering incentives to companies to export. In effect, banks and trading companies entered the mahogany business to take advantage of what amounted to a guaranteed profit (Newman in litt. 2000). As a result, there was a sudden but temporary surge in mahogany imports into the United States that year, saturating the U.S. market and leading to price decreases. During the 1990s, the United States imported an average 108,000 cubic meters of American mahogany, valued at an estimated US\$50 million to US\$70 million annually, from Central and South America (FAS 2000) (figure 5).

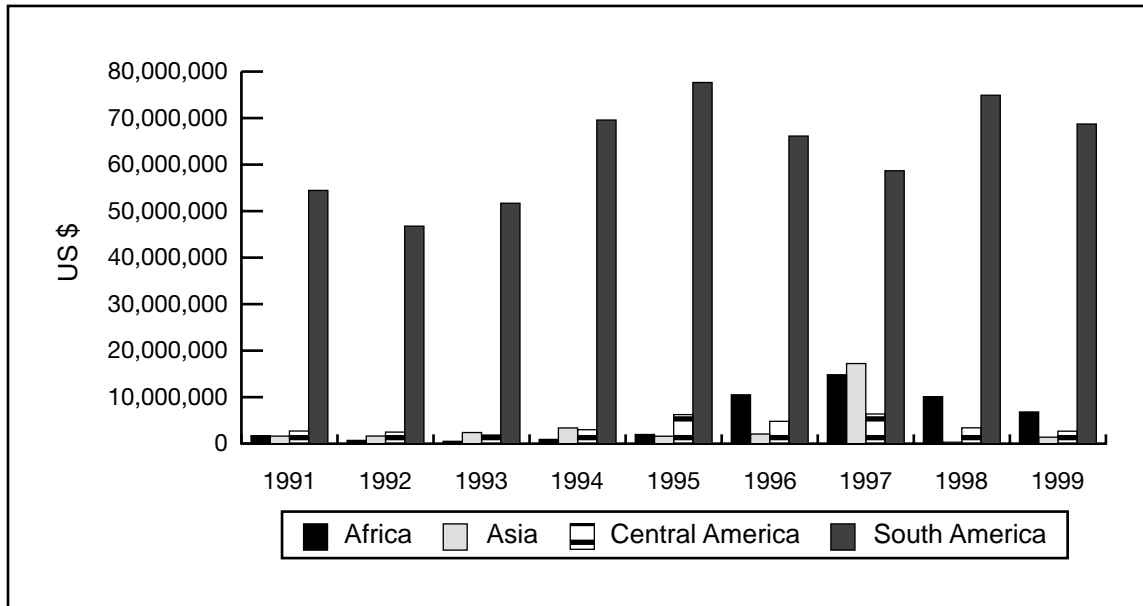
According to U.S. government data, approximately 10 percent of the mahogany imported into the United States from Latin America between 1991 and 1998 originated from Mesoamerica or Central America (FAS 2000). This number is consistent with another estimate placing the portion of U.S. mahogany imports from Central America at around this level (Lugo 1999). By comparison, however, the volume and value of mahogany absorbed by the United States from South America are much greater. Together Brazil and Bolivia accounted for three-fourths of the volume of U.S. imports of mahogany from the Americas during the period 1991 to 1999. It appears that U.S. imports from Bolivia grew during the mid-1990s but decreased in the late 1990s.

Figure 4. U.S. Mahogany Imports (1895-1999)



Source: U.S. International Trade Commission

Figure 5. U.S. Mahogany Imports by Region and Value (1991-1999)



Source: U.S. Foreign Agricultural Service

Similarly, the United States imported fewer shipments of mahogany from Brazil during the mid-and late 1990s than it did in the early 1990s. Lower U.S. mahogany imports from Bolivia and Brazil are, in part, related to government measures and moratoria aimed at protecting forests in these countries. In contrast, the share of U.S. imports from Peru has increased by an annual average of nearly 50 percent since 1991. Peru now surpasses Bolivia as the second leading exporter of American mahogany (table 1).

Table 1. U.S. Imports of Mahogany (*Swietenia* spp.) Lumber in Cubic Meters from Latin America (1992-1999)

Country	1991	1992	1993	1994	1995	1996	1997	1998	1999	% of total U.S. imports from 1991 to 1999
Belize	281	180	161	760	2,634	1,853	5,286	3,084	2,424	2
Bolivia	47,646	21,017	24,244	44,668	51,414	42,331	28,815	17,456	7,802	29
Brazil	54,913	71,558	66,901	54,381	51,388	35,324	34,375	46,634	40,907	47
Chile	2,957	343	442	4,474	9,490	6,622	400	0	0	3
Costa Rica	79	61	0	0	7	0	144	0	59	<1
Ecuador	0	89	0	0	50	0	0	0	344	<1
Guatemala	4,871	4,673	3,729	4,061	5,060	2,799	1,896	1,368	442	3
Guyana	0	0	0	0	0	20	2	3	0	<1
Honduras	141	491	775	1,668	951	10	62	37	2,222	1
Mexico	81	610	0	30	4,998	2,692	400	26	409	1
Nicaragua	412	164	913	688	3,653	3,925	7,483	1,615	1,628	2
Panama	0	0	0	0	0	84	0	71	0	<1
Peru	1,908	2,223	3,565	7,265	8,654	11,257	19,965	31,033	39,851	13
Venezuela	103	0	0	40	0	0	18	0	0	<1
Total	113,392	101,409	100,730	118,035	138,299	106,917	98,846	101,327	96,088	

Source: U.S. Foreign Agricultural Service, U.S. Department of Agriculture, U.S. Department of Commerce, and the U.S. Treasury

Minimally processed mahogany such as saw logs, sawn wood, and veneer sheets imported into the United States are, regardless of the source country, exempt from U.S. import duties. In terms of volume, sawn wood is the most abundant form of mahogany imported into the country. Conversely, very few U.S. imports consist of saw logs because many producing countries restrict the exportation of rough lumber. Value-added mahogany products, including various forms of plywood, veneered panels, and furniture, may incur no duties or duties as high as 8 percent depending on country of origin. Import duties levied on mahogany and other wood products from countries in Central and South America and the Caribbean may be further reduced or eliminated under existing trade programs, multilateral regional trade agreements, or bilateral initiatives aimed at aiding developing country economies or lowering trade barriers. While not specific to wood products, these agreements include the United Nations Conference on Trade and Development (UNCTAD) Generalized System of Preferences (GSP) program, Cartagena Agreement (e.g., ANDEAN Group), the Caribbean Basin Economic Recovery Act (CBERA), and the North American Free Trade Agreement (NAFTA).

Mahogany is milled and manufactured in the United States for a variety of purposes wherever an attractive and stable wood is required (IWPG 1988). Some of these uses include home and office furniture, architectural woodwork and paneling, radio and television cabinets, models and foundry patterns, boats and ships, sculpture, and turned and carved items (IWPG 1988). While commercial demand remains steady, U.S. big-leafed mahogany imports are lower today than in the late 1980s and early 1990s.

CITES Trade Data Analysis and Comparison

TRAFFIC undertook a detailed study of big-leafed mahogany trade in the United States to quantify imports; identify the number, location, and size of exporters and importers; and analyze CITES permits and certificates for irregularities. A summary of the implementation of CITES

Appendix III for big-leafed mahogany in the United States is provided on page 29. The analysis of U.S. imports of big-leafed mahogany is based on information from copies of CITES permits issued by Latin American countries for exports of mahogany saw logs, sawn wood, and veneer that were shipped to the United States in 1997 and 1998. Under a FOIA request, copies of these documents were provided to TRAFFIC North America by the U.S. Fish and Wildlife Service (FWS), which is the CITES Management Authority for the United States.

TRAFFIC compared its estimate of 1997 and 1998 U.S. mahogany imports with those calculated independently, though from the same source of information, by the FWS. TRAFFIC also compared its figures with those generated from CITES annual report data by the World Conservation Monitoring Centre (WCMC). The United States, like every CITES party, is expected to prepare and submit to WCMC through a designated government agency known as the CITES Management Authority (e.g., FWS) an annual report summarizing trade in CITES-listed species. So, in theory, CITES trade data maintained by WCMC and those contained in the CITES annual report prepared by FWS should be the same or very similar. For quality control purposes, WCMC reviews CITES annual reports and modifies data as necessary if errors are detected in these reports.

There is a 10 percent difference between TRAFFIC's estimate of mahogany imported into the United States in 1997 and the figure generated by WCMC from CITES annual report data provided by FWS (table 2). The reasons for the inconsistency between data sets are unknown, though it is possible TRAFFIC included in its analysis of 1997 imports CITES documents associated with mahogany shipments that actually entered the United States in late 1996 or early 1998. In some cases, the date on which shipments were inspected and cleared upon importation into the United States was not always legible or disclosed on CITES documents. This problem resulted in the data collector having to make inferences as to whether a CITES document with an ambiguous or no entry/clearance date entered the United States in 1997.

Table 2. Comparison of Sources of Data on U.S. Imports of Mahogany

Data Source	Compiling Entity	1997 U.S. Imports	1998 U.S. Imports
CITES documents	TRAFFIC North America	92,700 m ³	51,600 m ³
CITES annual report data	World Conservation Monitoring Centre	83,000 m ³	75,578 m ³ 2,409 m ² 1 shipment
U.S. CITES annual report data base	U.S. Fish and Wildlife Service		75,578 m ³ 2,409 m ² 1 shipment
U.S. Customs data	U.S. Foreign Agricultural Service	98,846 m ³	101,327 m ³

A much larger discrepancy exists between TRAFFIC's calculation of 1998 U.S. imports and the figure prepared by FWS from CITES documents. TRAFFIC's estimate is 30 percent lower. This lower estimate may be explained by CITES documents that TRAFFIC did not have at the time of its analysis. Because TRAFFIC's request for documents associated with shipments imported in 1998 was processed by FWS in early 1999, paperwork moving from the field (e.g., seaports) to FWS may have been delayed and omitted from the set of documents released to TRAFFIC. When FWS prepared its figure for 1998 imports in March - April 2000, the federal agency likely had a more complete set of CITES documents than TRAFFIC had a year earlier. Thus, the figure reported by FWS for 1998 is closer to the actual amount of mahogany imported into the United States that year.

CITES trade data, whether compiled by TRAFFIC, WCMC, or FWS, are not consistent with those generated by the U.S. Foreign Agricultural Service (FAS). FAS data are a subset of data of the U.S. Department of Commerce, Bureau of the Census, which compiles trade information on

commodities categorized under the Harmonized System of Tariffs (HST), a universal reporting system used by Customs for duty purposes. A disparity between the data sets might be expected because HST commodity codes, and thus FAS data, are more inclusive than those recorded under CITES. For instance, the HST quantifies semiprocessed mahogany commodities (e.g., plywood), which are exempt from CITES regulations and are therefore excluded from analyses using CITES data. Moreover, by virtue of HST's broad commodity categories, FAS data do not distinguish among the three species of *Swietenia* imported into the United States, aggregating all species for reporting purposes. One may presume, however, that U.S. imports of mahogany emanating from Latin America consist primarily of *S. macrophylla* because the other two species, *S. humilis* and *S. mahagoni*, are seldom traded internationally.

It is also conceivable that a small portion of mahogany shipments entering the United States is cleared by Customs but escapes the attention of agricultural port inspectors responsible for reporting CITES plant shipments and documents. While differences in the specificity and structure of trade reporting systems between CITES and HST help clarify the disparity in trade data, other possible reasons for the inconsistency should be identified and resolved.

U.S. Importing States and Companies

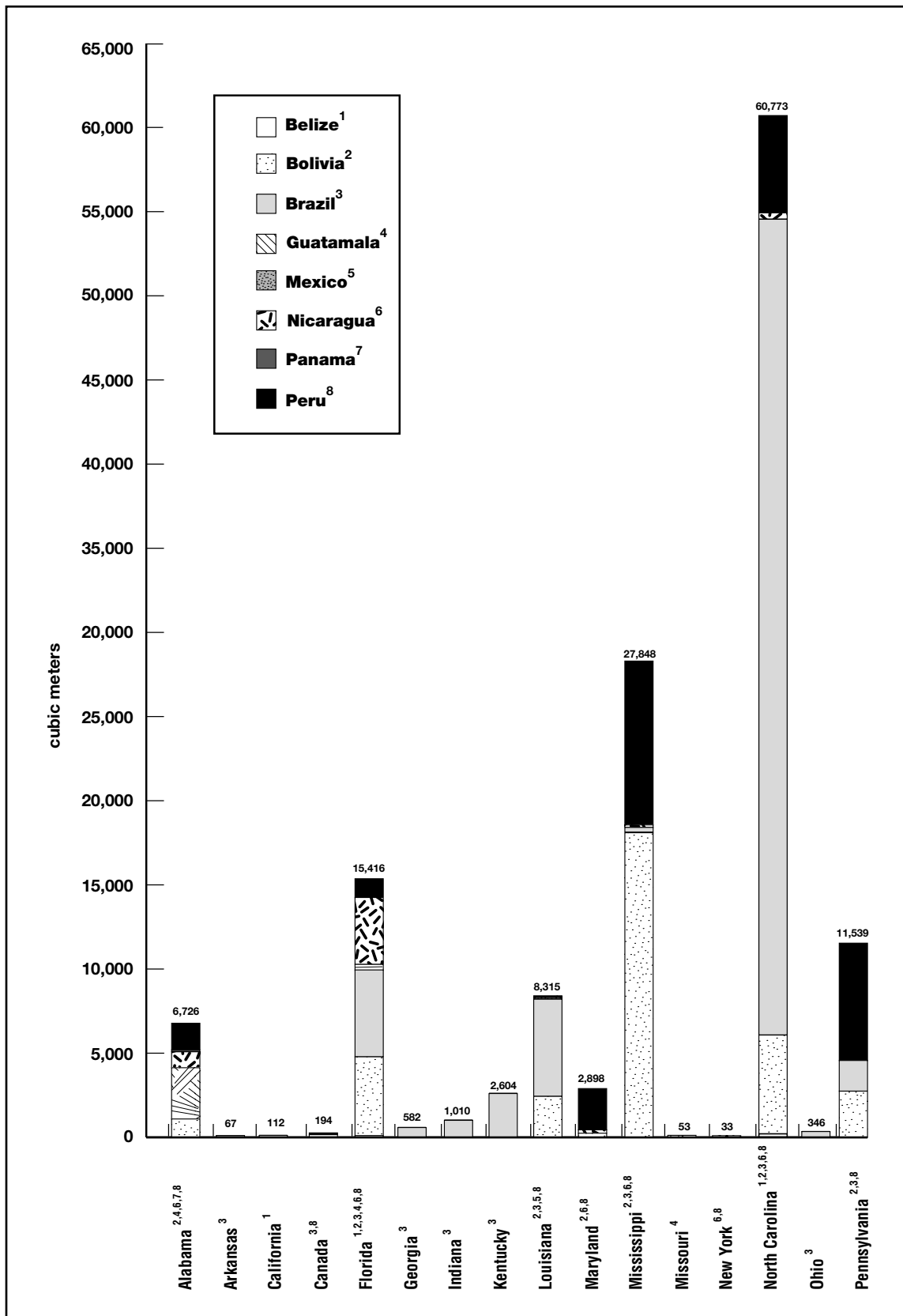
Imports of big-leafed mahogany into the United States are typically in the form of sawn wood and, to a lesser extent, veneer. A total of 62 companies reportedly imported mahogany lumber into the United States between 1997 and 1998. This total roughly corresponds with the 65 U.S. firms offering mahogany in a 1996 American sawmill reference guide. Most of the companies that import and supply big-leafed mahogany are concentrated in the mid-Atlantic and southern U.S. states, with the largest companies based in Florida, Mississippi, North Carolina, and Pennsylvania (figure 6). Companies based in North Carolina, the furniture manufacturing center of the United States, collectively imported 39 percent of the big-leafed mahogany destined for the U.S. market in 1997 and 1998 (figure 7). More than 60 percent of all furniture manufactured in the United States is made within a 200-mile radius of central North Carolina. Several shipments of mahogany reportedly destined for consignees in Canada, the Cayman Islands, and Great Britain were actually imported by six U.S. companies.

A wide range exists in the quantity of mahogany imported by U.S. companies, with volumes as low as 1 cubic meter to more than 30,000 cubic meters per importing company. Nine firms imported 75 percent of all U.S. mahogany shipments in 1997 and 1998; one company alone, based in Mississippi, accounted for 21 percent of U.S. imports. In 1997 and 1998, 25 percent of mahogany was imported by an estimated 55 U.S. firms, of which 46 imported individually less than 1 percent of U.S. imports during those years.

Mahogany Suppliers and the United States

Spanish traders and explorers in the early sixteenth century were the first group outside of Latin America to discover and commercially use mahogany. Commercial interest in mahogany developed in Europe long before North America became involved in the trade. The first reports of mahogany imports into colonial North America from Latin America were in the late seventeenth century, following British exploitation and trade in the species earlier that century (Lyon 1925; Lamb 1966). Some of the countries—particularly the West Indies (Cuba, Jamaica, Hispaniola), Mexico, and British Honduras (Belize)—that exported mahogany to the United States in the eighteenth and nineteenth centuries are no longer or infrequently involved in the trade today. Similarly, major contemporary suppliers of mahogany to the United States such as Bolivia and Brazil were all but absent from trade a century ago (appendix 1).

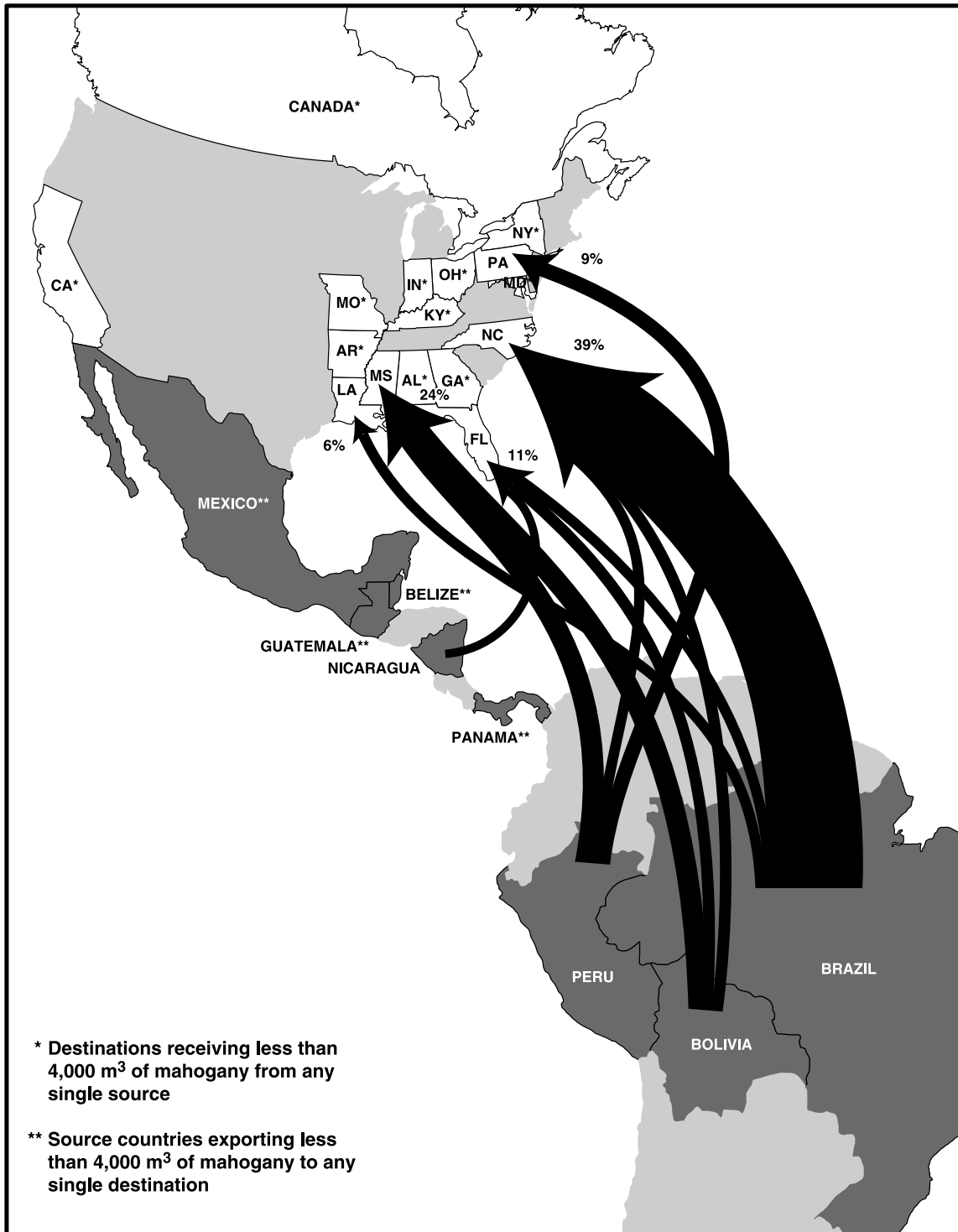
Figure 6. U.S. Imports and Reexports of Big-Leafed Mahogany from Latin America By Importing State or Country* (1997-1998)



Source: Data from CITES export permits and certificates of origin; compiled by TRAFFIC North America

* The final destination(s) of 775 cubic meters of big-leafed mahogany imported into the United States is not known.

Figure 7. Flow of Big-Leafed Mahogany to or through the United States from Latin America (1997-1998)



Source: Data from CITES export permits and certificates of origin; compiled by TRAFFIC North America

Cuba was the primary exporter of mahogany logs to the United States until 1880 (Mell 1930). However, it had all but stopped supplying the U.S. market by 1921 because of government restrictions to protect an increasingly rare resource for local furniture production (Mathews 1928). The volume of mahogany entering the United States from the West Indies was significantly reduced by the mid-twentieth century because of the virtual liquidation of all accessible

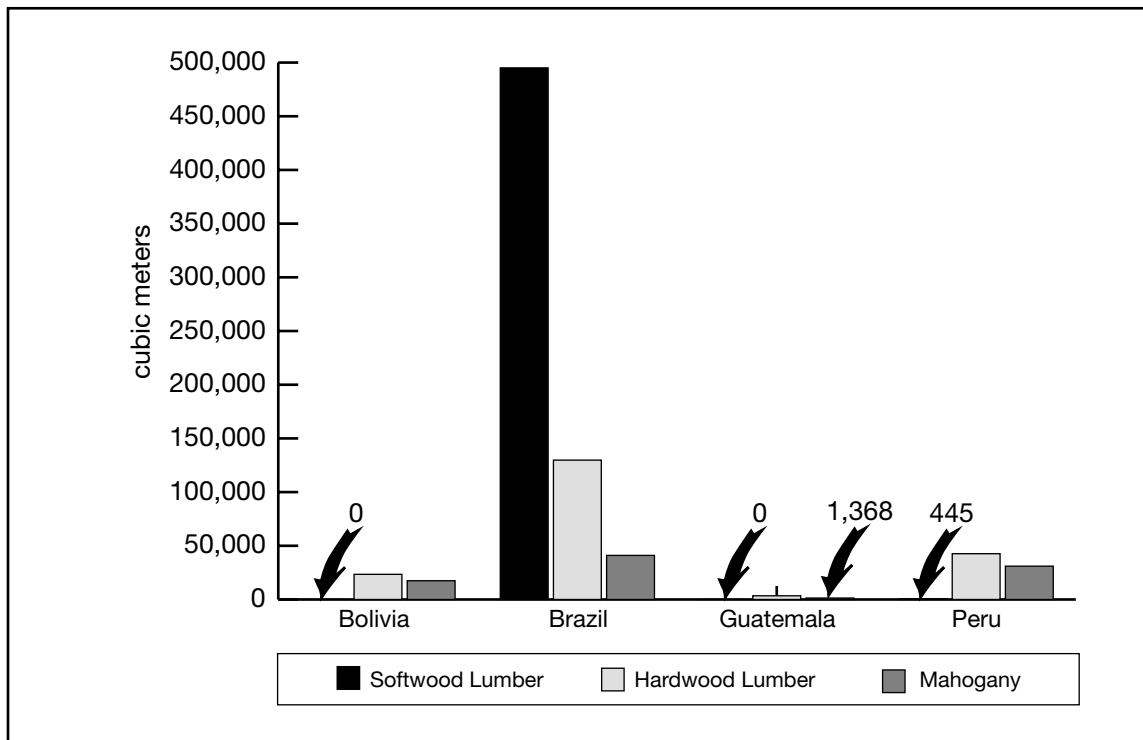
forests for domestic wood demand during and after World War II (Siegel and Row 1965). U.S. investment and logging operations in Mexico in the late 1800s prompted a gradual shift in the main mahogany markets from England and Europe to the United States (Lamb 1966). England remained a significant destination until a boycott decrying the environmental and social costs of mahogany logging in the early 1990s virtually crippled consumption in that country. In 1950, Mexico supplied half of the U.S. mahogany market; in 1965, less than 20 percent; and, by the late 1990s, only 1 percent (Siegel and Row 1965).

The volume of mahogany imported into the United States from Mexico and Central America declined substantially from 1900 to 1998. This region represents around 10 percent of all U.S.-bound exports of mahogany from Latin America today versus nearly 70 percent in early 1900 (Lugo 1999; Lamb 1966). Despite a general rapid fall in mahogany exports from Mesoamerica, recent data suggest mahogany reserves in the region may not be as depleted as previously assumed. Annual legal production of mahogany in the region is an estimated 125,000 cubic meters, with Nicaragua leading the regional harvest at 27 percent as recently as 1996. Honduras is the second largest producer (24 percent), followed by Mexico (22 percent), Guatemala (19 percent), Belize (6.5 percent), and Panama (.2 percent) (Calvo and Rivera 1999). Illegal cutting of mahogany is poorly documented but may be twice that of legal levels. Aside from the United States, Mesoamerican mahogany is also exported to Europe, El Salvador, and the Caribbean Islands. Concerns over the legality and rate of mahogany harvest have prompted government intervention such as restrictions on logging and exports, which may be partially responsible for lower U.S. imports from Mesoamerica. A ban on mahogany exports has been in effect in Mexico since December 1998, while a 1998 moratorium on mahogany logging in Nicaragua has made it difficult for many local producers to fulfill contracts there (Hammett et al. 1999).

By the mid-twentieth century, years of intensive mahogany extraction in the Caribbean and Mesoamerica had contributed to the commercial depletion of the resource in these regions. Importing countries responded to uncertain sources of supply in Central America and the Caribbean by investing in mahogany procurement and production in South America. Initially, the inaccessibility of mahogany stands in South America, especially in the Amazon Basin, was a major barrier to providing a reliable supply from that vast region. In particular, Brazil and Peru, today's first and second largest exporters, were slow to exploit their mahogany stocks for export (Siegel and Row 1965). South America has evolved into the most significant supplier of mahogany to U.S. and global markets in the twentieth century, with 97 percent of all U.S. imports originating from Brazil, Peru, and Bolivia. While they are major exporters, these South American countries are also significant users of mahogany logged from local forests, though quantities consumed domestically are not known. According to one estimate, Brazil consumes as much as 90 percent of the timber produced from the Amazon region. Another estimate puts Brazilian exports of sawn hardwood (mahogany is one of about 275 hardwood species native to Brazil) at 5 percent to 6 percent of that country's total production of sawn hardwood.

A comparison of U.S. imports of hardwood, softwood, and mahogany from Latin American countries for which data are available suggests that the prominence of mahogany as an exported timber species varies by country (figure 8). In 1998, mahogany accounted for 72 percent of all hardwood and softwood lumber imported into the United States from Bolivia, 67 percent from Peru, 21 percent from Guatemala, and 7 percent from Brazil. Mahogany assumes a much larger portion of U.S. lumber imports (32 percent) from Brazil when softwood lumber is removed from the equation and only hardwood lumber is considered (FAS 1999).

Figure 8. Comparison of U.S. Imports of Mahogany, Hardwood Lumber, and Softwood Lumber for Select Countries



Source: U.S. International Trade Commission

TRAFFIC North America identified and quantified from CITES documents the number of Latin American enterprises that supplied the United States with big-leafed mahogany in 1997 and 1998 (table 3). This exercise reveals the distribution of exporting enterprises across range states from which the United States received imports of big-leafed mahogany. In 1997, CITES documents indicate that the greatest proportion of companies exporting mahogany to the United States was in Bolivia (48), followed by Brazil (31), Peru (19), Nicaragua (16), Guatemala (11), Belize (8), and Mexico (4). Official government records indicate 33 Bolivian and 21 Peruvian companies reportedly exported mahogany in 1997. According to CITES documents, the number of exporters reported having shipped mahogany in 1998 decreased in Bolivia and Brazil, but increased in Peru. Government records confirm that the number of Bolivian exporters dropped by three in 1998, while the number of Peruvian exporters increased by eight (25 percent) from 1997 to 1998.

An analysis of official government records of mahogany exports from Bolivia indicates a relatively high level of turnover of mahogany exporters in that country (CITES Bolivian Authority 1999). The number of companies exporting mahogany from Bolivia steadily decreased between 1996 and 1999: 82 percent of the Bolivian companies that exported mahogany in 1996 exported in 1997, 74 percent in 1998, and an estimated 52 percent in 1999. At least 24 new companies entered the mahogany export business from 1996 to 1999. The relatively high rate of companies being replaced in the Bolivian mahogany export business may not be the norm in other producing countries. However, the trend in Bolivia is similar to information provided by one long-standing U.S. importer, who indicates the turnover rate of Latin American exporters supplying his company with mahogany is five years (Anon. 1999a). The causes of turnover in individuals or companies procuring and exporting mahogany may be as numerous as they are complex, although resource availability and accessibility are among the possible reasons.

Table 3. Latin American Companies Exporting Big-Leafed Mahogany to the United States for 1997 and 1998

Country of Origin	Number of Companies Exporting to United States (1997)	Volume (m ³) Received by United States in 1997	As a % of Mahogany Exports to United States (1997)	Number of Companies Exporting to United States (1998)	Volume (m ³) Received by United States in 1998†	As a % of Mahogany Exports to United States (1998)
Belize	8	263	<1%	2	175	<1%
Bolivia	48 (33) ❶	27,118	29%	26 (30) ❶	12,059	23%
Brazil	31	44,950	49%	29 (25) ❷	21,958	43%
Guatemala	11	3,512	4%	7	576	1%
Mexico	4	277	<1%	0	0	0%
Nicaragua	16	5,019	5%	4	579	1%
Panama	0	0	0%	1	71	<1%
Peru	19 (21) ❸	11,456	12%	12 (28) ❸	16,187	31%

† Data set for 1998 is incomplete and therefore is likely an underestimate of actual figures

❶ Figure in () compiled by Bolivian CITES Authorities
 ❷ Figure in () provided by government of Brazil, IBAMA
 ❸ Figure in () compiled by Peruvian CITES Authorities

Source: Compiled by TRAFFIC North America from copies of CITES export permits and certificates of origin, unless noted otherwise

Mahogany Survey

Claims abound of diminishing wild populations of big-leafed mahogany because of excessive exploitation, while counterclaims are raised of healthy natural populations unaffected by logging. The controversy over the adequacy and significance of information on the species' biological status does little to clarify or justify the need for mahogany management and conservation. As an alternate source of information, TRAFFIC explored whether and to what extent changes in mahogany supply and quality could be ascertained from the timber industry itself. To this end, TRAFFIC North America surveyed U.S. importers of big-leafed mahogany in 1998 to gather and evaluate information on their trading practices and perceptions toward mahogany demand, supply, quality, certification, plantation-grown wood, and other trade-related issues (appendix 2). The rationale for the survey was to take advantage of the experience and expertise of mahogany traders, who are in a favorable position to detect and explain permutations in mahogany availability and appearance. Many U.S. lumber companies are long-standing family enterprises whose intimacy with mahogany production and trade represents a unique opportunity to benefit from this knowledge.

TRAFFIC designed and distributed a voluntary, self-administered questionnaire to 54 U.S. companies that reported having imported or reexported big-leafed mahogany in the past. A subsequent letter was mailed to survey recipients reminding them to return completed questionnaires by the due date of 12 July 1999. The identities and addresses of recipient companies, which remain anonymous and confidential, were obtained from copies of CITES export permits or certificates of origin provided by the U.S. Fish and Wildlife Service. TRAFFIC consulted the Forest Products Laboratory of the Forest Service under the U.S. Department of Agriculture for technical assistance with the development of questions, as well as two U.S.-based timber trade associations, the International Wood Products Association (IWPA) and Hardwood, Plywood, and Veneer Association (HPVA), for questionnaire refinement.

Background

Nine questionnaires were partially or entirely completed and submitted to TRAFFIC, a response rate of approximately 17 percent. Respondents characterized themselves or their companies as importers or wholesalers of lumber, veneer, and plywood or as veneer or furniture manufacturers. A question asking whether respondents had ever imported big-leafed mahogany from Latin America was included to filter out those without a history of importing the species from the region. Eight respondents reported having imported big-leafed mahogany from Latin America, while a single respondent did not provide a response. Respondents were asked when they had first imported big-leafed mahogany; responses varied from less than one year to more than 15 years.

***S. macrophylla* Imports and Reexports**

All but two respondents reported importing big-leafed mahogany in 1998. Respondents indicated that sawn wood and veneer were the only mahogany products imported in 1998. Sawn wood was reportedly imported from Belize, Bolivia, Brazil, Nicaragua, Paraguay, and Peru, while veneer was imported from Bolivia and Brazil. An analysis of CITES documents confirmed U.S. mahogany imports from all of these countries, excluding Paraguay, in 1998. The volume of mahogany imported by respondents ranged from less than 100 cubic meters to more than 1,300 cubic meters. Respondents were asked to compare the volume of 1998 imports of big-leafed mahogany saw logs, sawn wood, veneer, plywood, or furniture with imports of these products 10 years ago. Four respondents indicated that their imports of sawn wood are higher today than 10 years ago, while one respondent reported lower imports of this commodity today than a decade ago. Two respondents held opposite views of trends in veneer imports, with one reporting lower imports of this commodity and another reporting higher imports. No respondents reported importing big-leafed mahogany saw logs, plywood, or furniture in 1998. U.S. reexports of big-leafed mahogany were destined for Canada, the Dominican Republic, the Caribbean Islands, and the Netherlands, according to three respondents.

Changes in U.S. Price/Demand for *S. macrophylla*

Mahogany prices are somewhat protected from sudden devaluation because the price elasticity for its lumber is moderately low. Therefore, increases in the supply of mahogany have a negligible impact on prices paid for timber because no substitutes of equal quality are effectively available (Kiernan and Freese 1997). The well-known desirability and strong demand among furniture manufacturers for big-leafed mahogany are reflected in its relatively high price (table 4), which has climbed 17 percent since 1995 (ITTO 2000b) (figure 9). Prices for Brazilian mahogany, Brazil's most valuable export sawn wood species, have been climbing since 1993. Reasons for higher prices include shrinking supplies caused by a ban on new concessions for mahogany in Brazil, continued strong demand in Europe and North America, and growing demand in Thailand and Japan (ITTO 2000a).

Six respondents confirmed that the wholesale price of mahogany is significantly or moderately higher today than it was in the late 1980s. In spite of higher prices, however, four of the six respondents indicated that their companies increased the number of purchases of mahogany from a decade ago. The other two respondents indicated purchasing less or the same amount of mahogany now as then. Two respondents believed the price of mahogany has been more or less stable; one reported a decrease in purchases and the other an increase. The purchasing patterns of domestic mahogany buyers were explored with U.S. importers. Respondents were asked to indicate which factors might have contributed to permutations in purchases of (demand for) mahogany from their company in the past 10 years. Two respondents, one importing more than 1,300 cubic meters of mahogany and the other less than 100 cubic meters, believe the reasons for decreased purchases of (demand for) mahogany can be attributed to dampened interest among U.S. consumers and mounting pressure from the conservation community. An improved U.S. economy and successful marketing were other reasons for higher mahogany sales in 1999 than during the past 10 years.

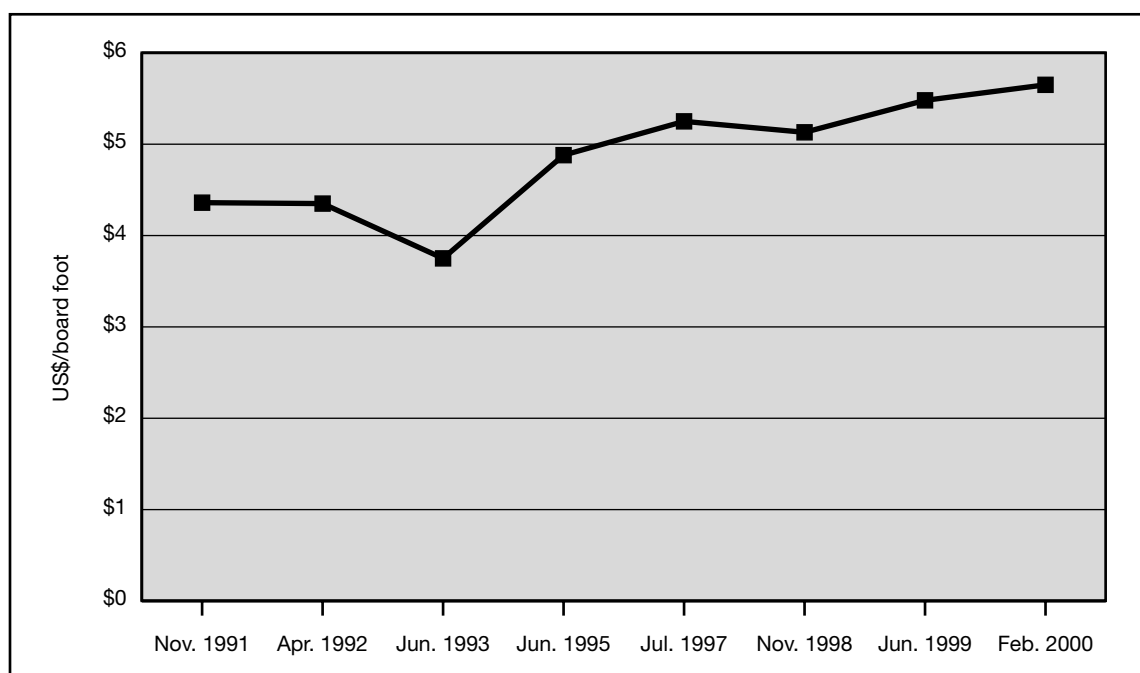
Table 4. International Prices for Sawn Wood of Various Tropical Tree Species (March 2000)

Trade Name	Scientific Name	Price (US\$) Per m ³	Location of Production	Price Source
Afzelia	<i>Afzelia</i> spp.	\$840	Ghana	Export (FOB)
Cumala (virola)	<i>Dialyanthera</i> spp.	266	Peru	Export (FOB)
Guaruba	<i>Peltogyne</i> spp.	190	Brazil	Asian Market
Mahogany (South American)	<i>Swietenia macrophylla</i>	932–1150	Peru Brazil	Export (FOB) UK Market
Mahogany (African)	<i>Khaya</i> spp.	750	Ghana	Export (FOB)
Mandioqueira	<i>Qualea</i> spp.	160	Brazil	Asian Market
Meranti	<i>Shorea</i> spp.	420–430	Malaysia	Export (FOB)
Perupok	<i>Lophopetalum</i> spp.	835–850	Malaysia	Export (FOB)
Sapele	<i>Entandrophragma cylindricum</i>	716	Ghana	Export (FOB)

Note: FOB is free-on-board

Source: International Tropical Timber Organization

Figure 9. Average Retail Price for Big-Leafed Mahogany on the U.S. Market



Source: <http://www.woodshopnews.com/stories/mahog/> and TRAFFIC North America

Changes in Availability or Supply of *S. macrophylla*

Four respondents, whose 1998 imports ranged from 100 cubic meters to more than 1,300 cubic meters, reported that their companies had experienced changes in their ability to obtain or maintain a reliable supply of mahogany compared with 10 years earlier. Respondents perceived these fluctuations as adversely affecting their company's inventories of mahogany. Discussions with U.S. importers confirm the volatility of the mahogany industry in producing countries where government-imposed logging restrictions or export quotas create an unstable and inhospitable business environment. For example, in Brazil, a major supplier, a countrywide moratorium on new mahogany concessions has been extended for another two years (ITTO 1998). Restrictive logging policies in Brazil and environmental measures in Bolivia are leading U.S. importers to procure

supplies elsewhere, including Peru (ITTO 1998; Worldwidewood 1999b). An importer whose company has a long history of importing mahogany from Latin America described the uncertain future availability of mahogany or mahogany suppliers as problematic. Underscoring this point, the company reports experiencing 100 percent turnover every five years in companies from which it purchases mahogany in Latin America. Other signs of increasing uncertainty over supply are being expressed in the United Kingdom, formerly a major importer, whose mahogany market as of late 1999 was characterized as strong yet severely undersupplied (Worldwidewood 1999a).

Another four respondents observed no changes in their companies' efforts to sustain mahogany inventories. Three of the four respondents whose companies were negatively affected by shortages in mahogany reacted by reducing their overall inventory and imports of mahogany, identifying new suppliers in the country where they typically purchased mahogany, and importing new and different species to help offset lower mahogany supplies. Two respondents indicated that they turned to sources of mahogany in countries from which they did not usually import the species. One respondent claimed to have gone out of business in response to difficulties procuring and maintaining a reliable supply of mahogany.

Changes in Quality of *S. macrophylla*

Wood technicians at the USDA Forest Products Laboratory assisted with the identification of traits that may or may not be desirable in mahogany. Respondents were asked to rate the importance of a series of traits that contribute to the quality of mahogany and then indicate whether they had recently observed changes in these traits. Subsequent feedback was requested to determine if these changes had positive, negative, or no impacts on sales to buyers of imported mahogany (table 5).

Table 5. Responses of U.S. Mahogany Importers Concerning Importance of and Changes in Mahogany Wood Traits

Trait Evaluated	Rate Importance of Trait as "Low," "Medium," or "High"			Observed Changes in Trait in Recent Years		Impact(s) of Observed Changes in Traits on Sales to Buyers		
	Low	Medium	High	Yes	No	Positive	Negative	None
Tension wood (fuzzy wood)	1	0	6	2	5	0	3	4
Color	0	5	3	4	4	1	4	2
Density	1	4	2	2	5	1	2	4
Straightness of grain in sawn wood	0	2	5	3	4	1	2	4
Stability or shrinkage	1	2	4	0	7	1	0	6
Workability	0	2	5	3	4	1	3	3
Drying	0	3	4	0	7	1	0	6
Resistance to decay fungi	0	3	4	1	6	1	1	5

Source: TRAFFIC North America

Respondents rated most traits as having high or medium importance, with "tension, or fuzzy wood" (a negative characteristic described shortly) believed to be the most important characteristic, followed by "straightness of grain in sawn wood" and "workability." The trait in which respondents observed the most physically visible changes was "color." The traits with the second most observed changes were "straightness of grain in sawn wood" and "workability" of the

wood. The two traits in which respondents did not observe any changes were "stability or shrinkage" and "drying." Most respondents reported that changes in color have had a negative impact on sales to buyers. Respondents indicated that there were no sales effects from any changes in stability or shrinkage and drying of mahogany, which is consistent with their beliefs that there were no changes in these traits.

In general, mahogany imported into the United States in the form of lumber is placed into two grades: "First and Seconds" (FAS) and "No. 1 and Better." The FAS grade accounts for 20 percent of U.S. mahogany imports, while No. 1 and Better makes up the remaining 80 percent of imports. The architectural millwork and door manufacturing industries each absorb 50 percent of the U.S. market for FAS mahogany. Furniture manufacturers use about 90 percent of the No. 1 and Better mahogany imported into the United States (Smith, Hass, and Luppold 1995).

As explained in the preamble of this section of the questionnaire, the quality and value of mahogany imported into the United States is determined by multiple factors, not the least of which is the subjective preferences of end users. The quality of mahogany depends partially on the absence or presence of undesirable or desirable traits. For instance, tension (fuzzy) wood is a defect characterized by the presence of gelatinous fibers and excessive longitudinal shrinkage. Tension wood may cause sawed surfaces to exhibit projecting fibers and planed surfaces to produce torn or chipped grain when wood is machined (WOW 1999). Fuzzy wood may occur more frequently in wood from smaller trees or in wood that has been cut too close to the bark (Anon. 1999b). Thus, it might be inferred from this definition that the absence of tension (fuzzy) wood is more favorable than its presence. The converse might be stated for "straightness of grain in sawn wood," whose presence is a desirable feature of mahogany.

While the results of this section of the questionnaire may not be statistically meaningful, they demonstrate that the desirability of mahogany traits, and changes in these traits, can be ascertained by surveying end users of the wood (e.g., American Furniture Manufacturers Association). Further research should be conducted to determine which mahogany traits are desirable; the extent, types, and significance of permutations (positive or negative) in wood; and possible explanations for differences or patterns in traits observed over an extended time period.

Level and Burden of *S. macrophylla* Trade Documentation

Virtually all respondents reported that the amount of paperwork associated with their imports of big-leafed mahogany had increased over the last few years. The amount of paperwork had remained the same for one respondent, while another did not provide an opinion. Three respondents believed that all three factors listed as response options (federal phytosanitary requirements, CITES Appendix III listing, and federal Customs declaration requirements) were responsible for the increased paperwork. Three respondents indicated that the CITES Appendix III listing was the sole factor for more paperwork, while one respondent cited the CITES Appendix III listing and federal Customs declaration requirements as reasons for the increase. Four respondents reported that the amount of additional paperwork has been a moderate burden to their company, whereas three believed it to be only a minimal burden.

Certified *S. macrophylla*

Only two respondents indicated ever having imported certified big-leafed mahogany into the United States from Latin America. These respondents claimed to have previously imported mahogany from forests certified by Servico Público Federal in Brazil and the Forest Stewardship Council (FSC) in Mexico. An Internet-based review of certified sources of mahogany in Central and South America identified several companies in the region that offer mahogany from certified forests (number of companies is in parentheses): Belize (1), Costa Rica (2), Guatemala (5), Mexico (1), and Panama (1) (ForestWorld 1999). Most of these companies claim to have been certified by FSC-Smartwood. TRAFFIC contacted a U.S. company known to have previously imported FSC-certified mahogany from Quintana Roo, Mexico, for an assessment of the

December 1998 Presidential Decree banning mahogany exports of lumber from that country. The company reported that the export ban effectively terminated its supply of mahogany from Mexico; as a result, the company had to locate and buy certified mahogany from producers in Guatemala. According to the same company, Mexico's moratorium may stem from a government strategy to elevate Mexican secondary manufacturers by only allowing the export of value-added mahogany products (Grant 1999).

Respondents importing noncertified mahogany were asked to select from a list of reasons why they had not imported mahogany from certified logging operations in Latin America. These reasons included a lack of available sources of certified mahogany (4 respondents), lack of demand for certified mahogany (3 respondents), more plentiful supplies of noncertified sources (2 respondents), the high price of certified mahogany (1 respondent), and disagreement with certification on philosophical grounds (1 respondent). The respondent who disagreed with the principle of certification commented that "the certifiers do not understand how to make mahogany sustainable. They do what they think is the truth and are not open to others' point of view or ideas." TRAFFIC questioned the meaning of this statement with a U.S. importer who believes this comment refers to the "top-down" or "bureaucratic" approach that certifying agencies employ in designing forest certification programs (Anon. 1999).

Those responses are similar to answers reported in a 1998 survey of U.S. wood brokers/wholesalers, household furniture manufacturers, and niche wood manufacturers. For instance, among the 126 companies surveyed that did not sell certified wood products, 35 percent of respondents gave weak demand as a reason for not marketing wood from certified sources. Other reasons for not buying and selling certified wood include the belief that wood is already from well-managed forests (17 percent) and market share does not necessitate purchasing certified wood (13 percent). Respondents also said that the cost of third-party certification is prohibitive, that there is a lack of supply of certified timber, and that there are no opportunities for penetrating the market for certified wood products (Stevens, Ahmad, and Ruddell 1998).

In addition, a misconception apparently exists among some U.S. mahogany importers concerning the meaning or purpose of certification and CITES. For instance, a Web site maintained by a major U.S. importer states, "The mahogany (*S. macrophylla*) that the company purchases is imported directly from exporters of record and does not go through a long chain of timber dealers assuring that the source of mahogany is always known and is verifiable. In fact 100 percent of the timber is CITES (Conference on International Trade in Endangered Species) certified prior to its entry into the United States" (T. Baird McIlvain International Company, date unknown). That statement is somewhat misleading because it implies that the CITES Appendix III listing for big-leafed mahogany in several range states is associated with a voluntary forest certification scheme, when in fact it is a regulatory mechanism. In the forestry community, forest "certification" is commonly used to describe forestry operations that receive from third-party certifying organizations special recognition in the marketplace for voluntarily practicing responsible forest management. CITES Appendix III is not a management tool but reinforces domestic protection of a species by ensuring specimens of that species were legally acquired and have the necessary permits before export.

Plantation-grown *S. macrophylla*

Respondents were surveyed for information on whether and from where their companies had imported plantation-grown big-leafed mahogany in the past. None of the respondents had previously imported mahogany grown on plantations in Latin America or the Caribbean, and only one respondent reported having imported big-leafed mahogany from outside this region (Indonesia). Two respondents commented on differences in the quality of big-leafed mahogany from plantations versus from natural forests. One respondent described plantation-derived mahogany as "softer and more difficult to machine," while the other stated that "plantation [mahogany] does not appear as dense or as easy to work. Color is lighter, grain is erratic, generally inferior in my experience."

The sentiments of U.S. importers suggest that the quality of cultivated mahogany may be more of a limiting factor in the marketplace than its general availability. Most successful mahogany plantations are found outside of the species' natural habitat because of the susceptibility of densely planted trees to the native parasitic shoot-borer moth (*Hypsipyla*). Globally, mahogany is cultivated in Fiji, Indonesia, Martinique, the Philippines, and Puerto Rico on 150,000 hectares of plantations (Lugo 1999). The area of mahogany under cultivation worldwide could reportedly yield 6 to 22 cubic meters per hectare per year, or between 6,820 and 25,000 cubic meters annually (Lugo 1999). Mahogany grown in the Philippines may consist partially of big-leafed, or genuine, mahogany (*S. macrophylla*), though it is more likely a species of *Shorea*, which is traded under the name of "Philippine mahogany," "meranti," or "lauan." Palau, another supplier of cultivated mahogany, is producing on an annual and sustainable basis about 50,000 board feet of Caribbean mahogany (*S. mahagoni*) from groves whose original trees were introduced and planted by Spanish missionaries more than three centuries ago (Duckworth 2000).

In spite of encouraging estimates of potential production, the low confidence of U.S. importers in the quality of cultivated big-leafed mahogany may undermine its commercial viability and dampen its popularity among end users in the United States. Alternatively, however, there may be a specialized market for lower-end, less-expensive cultivated mahogany, which would meet the needs of some users, yet would reduce overall demand for big-leafed mahogany from natural populations.

The ecological and socioeconomic costs and benefits of cultivating mahogany within or outside its natural range should be carefully and scientifically reviewed before plantations are adopted as an alternative to logging natural forests. While plantations may remove harvest pressure from wild populations, they could pose a threat to natural systems by encouraging clear-cutting of wild trees to make way for "tree farms." Moreover, the conversion of natural systems to plantations will likely result in the loss of biological diversity and replacement of native vegetation with introduced tree species. Changes in the ecological integrity and function of natural systems converted to plantations should be studied.

CITES Appendix III and Big-Leafed Mahogany

In a 1997 report, TRAFFIC reviewed the CITES Appendix III listing for big-leafed mahogany and identified problems with its implementation in exporting and importing countries. TRAFFIC recommended that CITES parties provide inspection personnel with the necessary technical skills and resources to understand and implement requirements for CITES Appendix III listings (Buitrón and Mulliken 1997). Toward this end, the U.S. government distributed to inspection personnel at U.S. ports of entry and exit clear and comprehensive guidelines for processing U.S. imports and reexports of big-leafed mahogany (USDA 1999). Undoubtedly, these guidelines have clarified and improved the implementation and enforcement of the listing in the United States. The U.S. government plans to make a revised version of these guidelines available on the Internet for the benefit of interested parties. This section summarizes the role and responsibilities of the U.S. government in implementing the CITES Appendix III listing for big-leafed mahogany, and highlights remaining operational, reporting, and permit issues that may need the attention of exporting countries and the United States.

Like other CITES parties importing species whose trade is regulated under the Convention, the United States is required to implement and enforce CITES listings, including those for three species of American mahogany (*Swietenia* spp.). Caribbean mahogany (*S. mahagoni*) and Pacific mahogany (*S. humilis*), though rarely traded today, are listed in Appendix II, while big-leafed mahogany (*S. macrophylla*), the most commercially traded *Swietenia* species, is listed in Appendix III. Certain commodities of Caribbean, Pacific, and big-leafed mahogany entering or passing through the United States are subject to inspection and approval by the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture (USDA). APHIS shares the responsibility of enforcing CITES trade controls for plants with the U.S. Fish and Wildlife Service (FWS), the U.S. CITES Management Authority.

Big-leafed mahogany harvested from natural populations in Latin America and traded internationally in the form of saw logs, sawn wood, and veneer is regulated under CITES. Imports of big-leafed mahogany grown on plantations outside of the species' natural range (Central and South America) are exempt from CITES regulations, although documentation to verify the origin of shipments from a place that is not a range state may be needed. Exports of any of these commodities originating in countries where the species is listed in Appendix III (Costa Rica, Mexico, Bolivia, Brazil) must be accompanied by a valid CITES export permit issued by their designated CITES Management Authority. CITES certificates of origin are required for exports originating from Latin American countries where big-leafed mahogany is not listed in Appendix III. Moreover, mahogany consignments imported into a country for subsequent reshipment require a CITES reexport permit from the country of reexport.

APHIS inspection personnel process incoming mahogany shipments by determining whether the species and specimens being imported are subject to CITES regulation, verifying the authenticity of CITES export permits or certificates of origin, physically inspecting cargo, and certifying shipments by stamping the original CITES document. Original CITES documents are submitted to FWS; photocopies are provided to the importer and kept on file at the authorized port of entry. Interaction is minimal between APHIS and U.S. Customs because the two agencies have different regulatory and administrative requirements, most of which are handled separately by Customs brokers who are hired by importers to oversee the receipt and release of imported goods. Individual brokers who routinely process CITES paperwork associated with mahogany shipments are knowledgeable of the requirements, but those having minimal experience with mahogany are unfamiliar with the procedures involved (USDA in litt. 2000).

Consignments imported without the proper paperwork may be placed on "Plant Quarantine (PQ) Hold" and delayed for release until the shipper can provide the necessary documents. Delays also arise when the units of measure used to express quantities of imports of mahogany lumber on permits are different from those recognized by the U.S. government. The onus of converting unofficial units to acceptable units falls on Customs brokers, who must provide under APHIS's rules for release a "statement of conversion." In general, shipments of CITES species are more time-consuming for APHIS inspectors, who can take anywhere between one to two hours and a week or more to process mahogany shipments upon importation. Tropical timber species that resemble mahogany are occasionally encountered at major ports of entry and can be mistaken for mahogany if not carefully inspected. When imported mahogany cargo is shipped with multiple timber species, APHIS estimates visually the amount of mahogany or may ask Customs brokers to identify, separate, and quantify (in cubic meters) each species of wood product (USDA in litt. 2000).

Reexports are handled in a similar fashion to imports, though big-leafed mahogany transiting the United States for reexport to another country must have the necessary paperwork from FWS. Other documentation such as phytosanitary (plant health) certificates, a USDA general permit, and cargo paperwork (bill of lading, U.S. Customs entry, and invoice) may also be required for mahogany entering or leaving the country (USDA 1999). At present, mahogany does not appear to pose any phytosanitary concerns to APHIS port inspectors (USDA in litt. 2000).

Fifteen maritime ports are designated by the U.S. government for the importation, exportation, and reexportation of CITES-listed timber species and their parts or derivatives such as saw logs, sawn wood, or veneer (50 CFR Part 24, Subpart B §24.12(e)). An additional 15 ports designated for CITES-listed plants can also be used for the processing of trees listed on CITES (big-leafed mahogany included) because APHIS has adequate staff and facilities to satisfy enforcement responsibilities of such listings at these locations (50 CFR Part 24, Subpart B §24.12(a); Lidsky in litt. 2000). TRAFFIC compiled information on the port location and date of release of mahogany imports from "USDA, PPQ Release Stamps," which are imprinted on CITES paperwork for endorsement purposes. In 1997 and 1998, big-leafed mahogany was reportedly imported through 18 U.S. seaports (table 6). Ports receiving and processing the greatest volume of

mahogany in 1997 and 1998 were Savannah, Georgia, and Gulfport, Mississippi, which together accounted for nearly two-thirds of mahogany imports during these years. Some 12,000 cubic meters traded under the names of companies located in Alabama, Arkansas, California, Florida, Louisiana, Maryland, Mississippi, North Carolina, Ohio, Pennsylvania, and one unknown destination were imported through unspecified U.S. ports. It is possible that APHIS stamps denoting date and port of release did not photocopy clearly and were therefore not visible on photocopies of CITES documents analyzed by TRAFFIC.

Table 6. U.S. Ports of Entry for Mahogany Imported and Cleared into the United States during 1997 and 1998

U.S. Port of Entry	State	Volume of Mahogany (cubic meters)	Reported Origin of Mahogany Imported
Baltimore	Maryland	10,171	BO, BR, PE
Brownsville ¹	Texas	277	MX
Charlestown	South Carolina	13,947	BO, BR, PE
Gulfport	Mississippi	37,267	BE, BO, BR, GT, NI, PE
Houston	Texas	359	BE, BO, BR
Jacksonville	Florida	290	BR
Miami	Florida	9,483	BE, BO, BR, NI, PE
Mobile	Alabama	3,219	BR, GT, NI, PA, PE
Morehead City	North Carolina	168	PE
New Orleans	Louisiana	1,508	PE
New York	New York	102	BO, PE
Norfolk	Virginia	1,129	BR
Pascagoula ²	Mississippi	70	GT
Pensacola ³	Florida	1051	NI
Philadelphia	Pennsylvania	5,590	BO, BR, NI, PE
Unidentified	Puerto Rico	79	NI
Savannah	Georgia	47,902	BE, BO, BR
White Marsh ⁴	Maryland	57	NI
Unidentified Ports		12,258	BE, BO, BR, PE

¹ Subport of Houston, Texas
² Substation of Gulfport, Mississippi
³ Substation of Panama City, Florida
⁴ Considered part of Baltimore, Maryland, port
Country Codes: BE (Belize); BO (Bolivia); BR (Brazil); GT (Guatemala); MX (Mexico); NI (Nicaragua); PE (Peru)

Source: CITES export permits and certificates of origin; computerized by TRAFFIC North America

Mahogany shipments are imported into several U.S. ports that, while not designated ports themselves, fall under the jurisdiction of nearby ports that are approved for processing mahogany and other plants regulated under CITES. Such ports include Brownsville, Texas (subport of Houston, Texas); Pascagoula, Mississippi (substation of Gulfport, Mississippi); Pensacola, Florida (substation of Panama City, Florida); and White Marsh, Maryland (part of Baltimore, Maryland, port). It is also conceivable that shipments of big-leafed mahogany that land at non-designated ports are subsequently transferred under U.S. Customs bond to designated ports for clearance. If and when mahogany consignments arrive at nondesignated ports, APHIS arranges the transfer of the entire shipment under U.S. Customs bond at the owner's expense to the closest designated port for processing (USDA 1999). Another alternative for processing mahogany at nondesignated ports involves dispatching a qualified APHIS officer from the closest authorized port to inspect and clear shipments at the relevant satellite port. For example, APHIS, on

occasion, has dispatched an officer from Panama City to process mahogany shipments that entered the country at the port of Pensacola, Florida (Lidsky in litt. 2000).

Review of CITES Permits

During its review of CITES documents, TRAFFIC detected various permit irregularities that, while not numerous or apparently significant, should be addressed to improve implementation of the CITES Appendix III listing in exporting and importing countries. A few instances of U.S.-based companies importing mahogany under the names and addresses of affiliated foreign consignees in Canada, the Cayman Islands, and the United Kingdom were documented and conveyed to FWS. CITES documentation issued for exports of big-leafed mahogany destined for the United States must disclose a U.S. consignee.

The use of different units of measure on CITES documents, which has been previously reported as a source of confusion to APHIS inspectors, was encountered on CITES documents analyzed by TRAFFIC (Buitrón and Mulliken 1997). For instance, quantities of 1997 and 1998 imports of U.S. big-leafed mahogany from Latin America were expressed in board feet, cubic meters, and kilograms (table 7). While CITES allows the use of multiple units of measure, the United States requires that U.S. imports of lumber and logs be expressed in cubic meters and veneer in square meters (USDA 1999).

Several of the documents issued by Latin American countries for exports of mahogany entering the United States in 1997 and 1998 are anomalous and do not conform with facsimiles on file with U.S. inspectors.

Table 7. Units of Measure Used by Exporting Countries for Expressing Quantities of Mahogany Lumber and Veneer on CITES Documents

Country	Unit of Measure
Belize	board feet, cubic meters, kilograms
Bolivia	board feet, cubic meters
Brazil	cubic meters
Guatemala	board feet, cubic meters
Mexico	board feet, cubic meters
Nicaragua	board feet, cubic meters, kilograms
Peru	board feet, cubic meters, kilograms

Belize. In 1997 and 1998, Belize was the origin of a few mahogany consignments imported into the United States for which non-CITES documentation apparently had been issued. Two Generalized System of Preferences certificates of origin were stamped for export in May 1997 and July 1998 for 6,912 board feet and 51,495 pounds (23,357 kilograms) of mahogany, respectively. The former was cleared by APHIS in Gulfport, Mississippi, while the latter, destined for San Francisco, was absent of an APHIS stamp indicating the shipment's release by the agency. Another shipment from Belize, cleared by APHIS in Miami in February 1997, was disclosed on a Customs declaration form stamped by the Forestry Department, which is the CITES Management Authority of Belize.

Bolivia. Six shipments exported from Bolivia in 1997 totaling at least 562 cubic meters were reported on General System of Preferences certificates of origin issued by the Ministerio de Hacienda y Desarrollo Economico. Three shipments were cleared by APHIS in Baltimore in October 1997, and two cleared in Charleston, South Carolina, on an unspecified date. The release date of another could not be determined due to apparent absence of an APHIS stamp. The United States was the recipient of a shipment of 38 cubic meters of mahogany reported on an Andean Trade Preference Act certificate of origin bearing the stamp of the Camara Nacional

Forestal dated August 1997. An APHIS release stamp was not visible on the certificate. Neither the Ministerio de Hacienda y Desarrollo Economico nor the Camara Nacional Forestal is the CITES Management Authority of Bolivia.

Guatemala. The majority of the mahogany shipments imported into the United States from Guatemala in late 1996 and 1997 were accompanied by certificates of origin issued by the Camara de Comercio and, in a few cases, by the Camara de Industria, neither of which is the CITES Management Authority of Guatemala. Apparently, most shipments were inspected and cleared by APHIS in Mobile, Alabama, or Gulfport, Mississippi. However, in some instances, documents do not display an APHIS release stamp. In February, March, and June 1998, APHIS at the Port of Mobile cleared a combined 31,600 kilograms of mahogany for which a certificate of origin had been issued by the Camara de Comercio.

Nicaragua. In 1997, a total of four mahogany consignments from Nicaragua for which the Centro de Tramites de las Exportaciones (not the CITES Management Authority of Nicaragua) had issued Generalized System of Preferences certificates of origin were imported into Mobile, Alabama, via Guatemala and into Puerto Rico via Honduras. In May and June 1998, APHIS cleared two additional imports totaling 41,687 board feet for which the Centro de Tramites de las Exportaciones had issued Caribbean Basin Initiative Generalized System of Preferences certificates of origin. It should be noted that in other instances non-CITES certificates of origin from Nicaragua were attached to CITES export permits. In one instance, it appears that the amount authorized on a CITES export permit issued by the CITES Nicaraguan Management Authority was actually the sum total of big-leafed mahogany and cedar wood included in the same shipment (Albert in. litt. 1999).

Peru. A number of mahogany shipments imported into the United States from Peru in 1997 and 1998 were reported on non-CITES documents: five Generalized System of Preferences certificates of origin stamped by the Ministerio de Industria, Turismo, e Integración y Negociaciones Comerciales Internacionales (MITINCI) for approximately 375 cubic meters of mahogany; one bill of lading issued by Seaboard Marine, Ltd., for 627 cubic meters; and three invoices issued by Peru Timber, S.A., for a combined 420,789 board feet. A few of these shipments were cleared by APHIS at the ports of Baltimore, Maryland; Gulfport, Mississippi; and New York, New York. APHIS stamps apparently were missing from all three invoices of Peru Timber S.A., and no APHIS stamp was displayed on a Generalized System of Preferences certificate of origin issued in April 1998. MITINCI has authority over timber mills and processing, whereas the Ministerio de Agricultura (INRENA), the designated CITES Management Authority of Peru, administers and approves export permits.

U.S. Reexports

TRAFFIC's review of 1997 and 1998 CITES documents did not include an analysis of CITES reexport permits issued by the U.S. CITES Management Authority for U.S. reexports of mahogany. However, Canadian Customs reports that CITES reexport permits issued for U.S. reexports of big-leafed mahogany bound for Canada are escaping validation by U.S. inspectors at ports along the U.S.-Canadian border (Wenting pers. comm. 2000). An assessment of Canadian imports of tropical timber reveals procedural problems involving shipments of mahogany entering Canada via the United States and from range states.

CONCLUSION AND RECOMMENDATIONS

This report aims to summarize and characterize mahogany trade within the context of the United States and inform U.S. consumers, from lumber importers to end-use consumers, about the implications of their purchasing decisions for mahogany conservation. It is not the intention of this report, nor within its scope, to address biological questions surrounding the sustainability of mahogany extraction for U.S. consumption. It would be shortsighted and inaccurate to suggest that mahogany exploitation is driven solely by U.S. commercial interests without analyzing the complex web of social forces, economic decisions, and land-use policies within mahogany range states that affect mahogany conservation and, more broadly, forest utilization and management. Moreover, demand for mahogany is not confined to the United States. For instance, companies from Argentina, Bolivia, Canada, Chile, Italy, Japan, and Spain compete for sources of mahogany by bidding on timber concessions in the Biabo-Cordillera Azul region of Peru. These exceptions notwithstanding, trade figures are compelling. They confirm that the dominant market for mahogany outside of Latin America is the United States, which absorbs more than 50 percent of all mahogany traded from the region, primarily from Peru, Brazil, and Bolivia. The enormity of the U.S. mahogany market stems from the wood's continued popularity among U.S. manufacturers, vendors, and consumers combined with the perception that the timber remains plentiful and profitable.

It is not an overstatement to say that mahogany production is highly correlated with resource availability and that geographic shifts in production owing to unpredictable supplies are as visible today as they were centuries or even a few decades ago. For instance, the extraction and exportation of mahogany for international trade has moved gradually south from Caribbean and Central American countries to previously isolated and dense tropical forests of South America. The liquidation and conversion of forests in the former two regions resulted in the commercial depletion of mahogany stands (and two mahogany species, *S. mahagoni* and *S. humilis*), and redirected the search for alternate, more abundant sources of timber. The tropical forests of South America were the next and possibly the last promising place for mahogany exploitation. The highest prices for big-leafed mahogany in almost a decade and growing reliance on substitute species such as African mahogany (*Khaya* spp.) suggest supplies of mahogany from the Americas are increasingly limited in areas where they were previously plentiful.

Trade data suggest that while the average volume of mahogany traded from South America remains within stable levels, U.S. imports of mahogany from some countries are declining while imports from others are increasing. Thus, at the regional level (e.g. South America), observers see no net change in the flow of mahogany from Latin America to the United States, though an increase or decrease in exports from specific countries is clearly occurring. For instance, U.S. imports of mahogany originating from Bolivia declined by 20 percent from 1995 to 1996, 31 percent from 1996 to 1997, 41 percent from 1997 to 1998, and as much as 57 percent from 1998 to 1999. Following an opposite yet corresponding trend, the United States increased its imports from Peru by 20 percent from 1995 to 1996, 45 percent from 1996 to 1997, 33 percent from 1997 to 1998, and a minimum of 17 percent from 1998 to 1999. Although Peruvian forests supply a greater share of mahogany to global markets, the distance from forests containing mahogany to mills increases annually, indicating a practice of mining versus managing trees (ITTO 1998).

Even U.S.-bound exports from Brazil, the region's dominant mahogany producer, are considerably lower today by recent historical standards. In Brazil's case, part of the explanation rests with the government's extension of a 1996 moratorium on new logging concessions for mahogany and reduced export quotas. Tighter controls on mahogany exploitation and exportation in Brazil are signs of heightened concern for the species. Regardless, perhaps anticipating shortages of mahogany from Brazil's logging restrictions, U.S. companies are purchasing and procuring new concessions and species within and outside the Americas.

Consuming countries and companies are responding indirectly or directly to questionable logging practices and places by importing mahogany from reputable or certified sources. For instance, the city of Santa Monica, California, passed an ordinance prohibiting the purchase of numerous tropical timber species, including mahogany, for use in city projects. In the United Kingdom, a group of lumber firms has pledged to import mahogany from legal sources in the state of Para, Brazil. Similarly, U.S. companies, though few in number, are procuring and promoting mahogany from certified forests in Guatemala, among other countries. Consumers and companies alike are predicted to respond favorably to certified forest products as public opinion and market share for such products expand (Stevens, Ahmad, and Ruddell 1998). Producing countries are also reacting in different ways to perceived changes in mahogany availability. Some are taking protective measures, while others are making mahogany more accessible to foreign investment and exploitation. Peru, which has supplanted Bolivia and is barely behind Brazil as the largest producer of mahogany, is promoting the sale of 50-year logging concessions to international companies. Brazil, Mexico, and Nicaragua have imposed some form of restrictions on logging or exportation of mahogany. In Costa Rica, Guatemala, and Mexico, certified forestry operations have been established and offer mahogany from sustainably managed forests.

Range states and importing countries have previously proposed regulating the international trade in big-leafed mahogany by listing the species on CITES Appendix II, but industry has strongly opposed those efforts, which have been unsuccessful. In contrast, Appendix III listing for big-leafed mahogany has been embraced by several range states and its implementation in exporting and importing countries has undeniably improved the monitoring, transparency, and legality of international trade in the species. For instance, information from CITES documents enables researchers to document trade volumes and patterns, changes which might have implications for conservation. Appendix III has encouraged the world's largest mahogany consumer, the United States, to provide port personnel with a step-by-step mahogany inspection and processing manual. Despite its proven merits, Appendix III is precluded from reaching its full potential as a regulatory mechanism because of unresolved procedural and permit-granting problems in exporting range states and the United States. Conservationists also question the long-term conservation value of Appendix III because it does not require countries to consider biological criteria or concerns in approving exports.

As the world's leading consumer of big-leafed mahogany, the United States, through its industry, consumers, and government, should consider adopting behavior and policies that support the conservation of the species. From its review of the U.S. mahogany market and CITES Appendix III listing, TRAFFIC North America has identified the following issues that merit action, monitoring, or further research in the United States and mahogany range states.

Educate Mahogany Consumers on CITES and Expand Markets for Certified and Plantation-grown Mahogany

TRAFFIC surveyed U.S. importers for input on mahogany trade, availability, quality, regulation, certification, and plantation-grown timber. Responses to questions have helped clarify or confirm their practices, preferences, and perceptions toward each of these issues. For instance, misconceptions about CITES as a certification mechanism for mahogany are still prevalent, which suggests a need for more educational outreach to U.S. timber importers. And some of the reasons for not importing mahogany from certified sources are consistent with those reported in a survey of U.S. furniture manufacturers (Stevens, Ahmad, and Ruddell 1998). Exploring and establishing a U.S. market for certified or plantation-grown mahogany might improve the management and conservation of the species and its natural populations. Surveys targeting U.S. furniture manufacturers, retailers, and consumers of mahogany may reveal new constraints and opportunities for promoting certified and cultivated mahogany.

Improve Implementation and Effectiveness of CITES

The shortcomings in the implementation of CITES Appendix III described in this report do not diminish the contribution this mechanism has made to improving the transparency and monitoring of trade in big-leafed mahogany. Despite these benefits, gaps are evident in implementing procedure and permits for the big-leafed mahogany listing in the United States as well as in mahogany-exporting range states. These gaps include issuance of non-CITES documents for mahogany shipments destined for the United States by agencies other than the designated CITES Management Authority; wide variation in units of measure used to express mahogany quantities on permits; possible reexportation of mahogany from the United States without prior validation of documentation by USDA/APHIS; and possible insufficient training or knowledge among Customs brokers concerning procedures for processing CITES paperwork.

CITES parties that export and import mahogany are encouraged to emulate the U.S. government in preparing guidelines that clearly outline the steps for handling mahogany exports, imports, and reexports for port inspection personnel. To improve the transparency of mahogany exports and the administration of permits associated with such exports, the exporting range states (including Peru, Guatemala, and Nicaragua) that have yet to list in Appendix III their natural populations of *S. macrophylla* are encouraged to do so. Range states and consuming countries should also seriously consider the management merits of a CITES Appendix II listing. An Appendix II listing for big-leafed mahogany may not be as costly or complex to implement in range states if the management criteria of existing certified forests are equivalent or similar to those used for making no-detriment findings under Appendix II.

Monitor Conservation Implications for Mahogany Substitutes (African Mahogany)

As the U.S. market reacts to increasingly expensive and limited supplies of American mahogany, U.S. consumer interest in African mahogany (*Khaya* spp.), among other suitable substitutes, appears to be growing. U.S. importers may be searching for and importing substitute species like *Khaya ivorensis* for reasons related to lower supplies of *S. macrophylla* or negative public opinion surrounding the latter's use. The conservation implications of the timber industry making a transition from American to African mahogany are not clear, though they raise potential concerns because the American species has historically been more abundant, accessible, and affordable than its African equivalent. Additional research is needed on which tree species are commercially and ecologically acceptable substitutes for American mahogany. Market acceptance of secondary timber species may relieve some of the pressures and concerns for American mahogany, but it does not resolve fundamental mahogany management issues and needs.

Fund Mahogany Conservation through Import Duties

Mahogany imported into the United States in the form of semiprocessed commodities is exempt from duties imposed on other products like plywood and furniture. Under the program for Generalized System of Preferences and possibly other trade programs, the United States can impose or increase duties for imports of commodities. The U.S. government could levy a nominal duty on imports of mahogany from Latin American range states, and redirect funds derived from duties back to exporting countries for mahogany conservation and management. This concept is akin to a toll road whereby revenue is collected from drivers for maintaining and improving a heavily used infrastructure. The amount of funding redistributed to range states could be proportionate to the amount of mahogany imported by the United States from countries of origin. Funds raised under this mechanism might be administered by the U.S. Agency for International Development or an intergovernmental organization like the United Nations Environment Program. Any increase in import duties could be balanced by lowering or waiving duties levied on wood products of non-threatened tree species. The cost associated with increased duties on mahogany imports would presumably be passed along to consumers. In effect, however, U.S. consumers would be reinvesting in mahogany by providing range states with the financial resources to manage forests and implement and enforce harvest and export regulations.

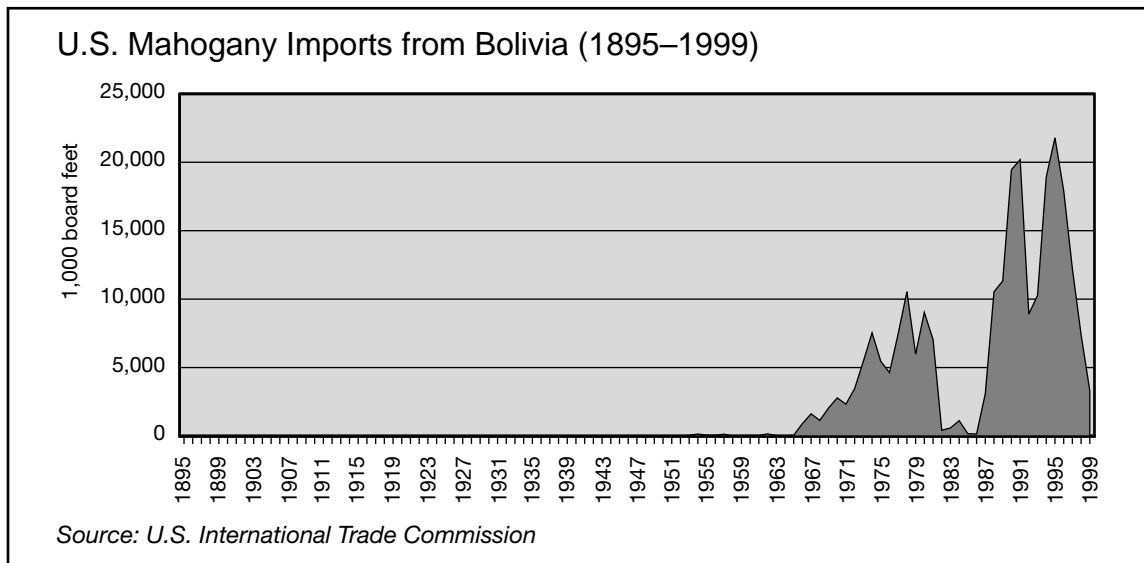
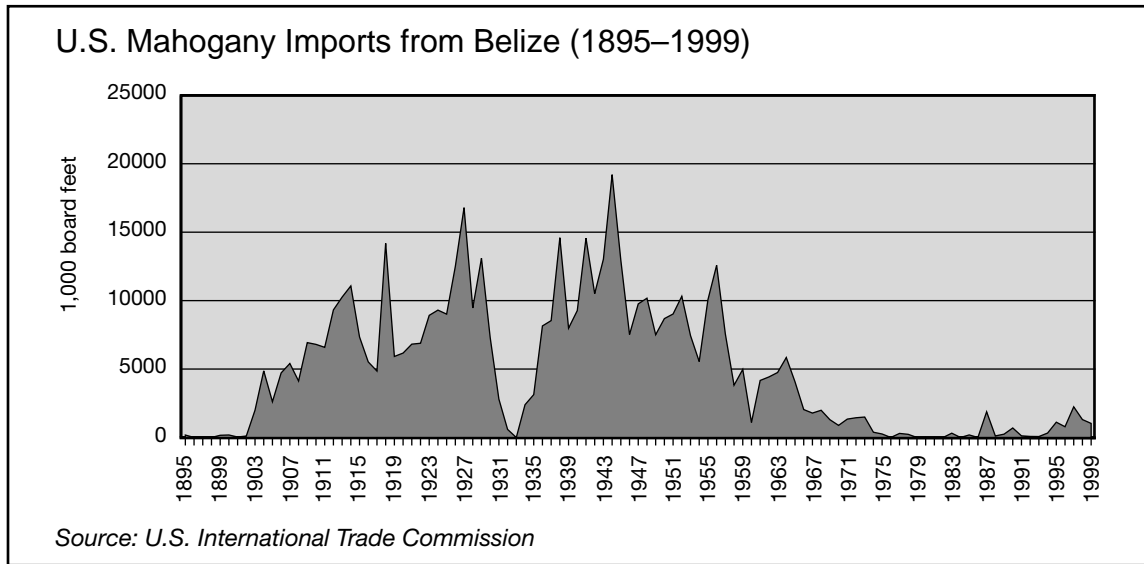
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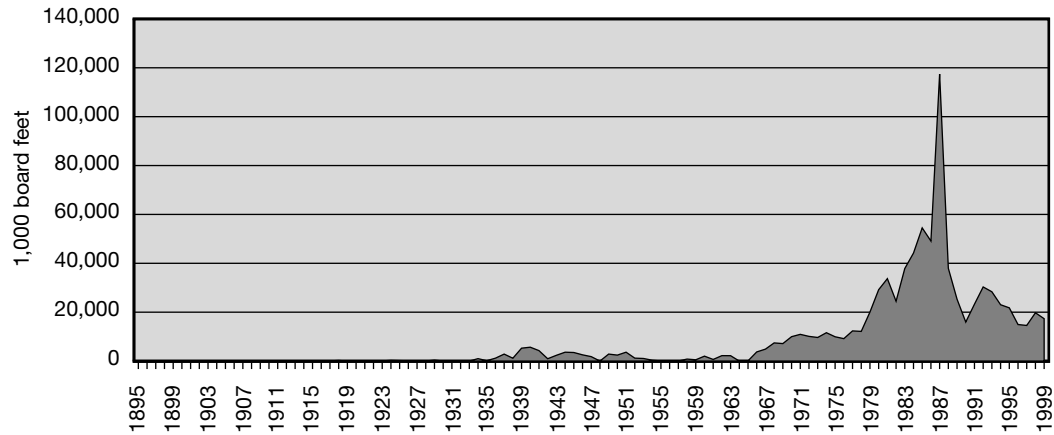
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APPENDIX 1: A CENTURY OF U.S. MAHOGANY IMPORTS BY EXPORTING COUNTRY

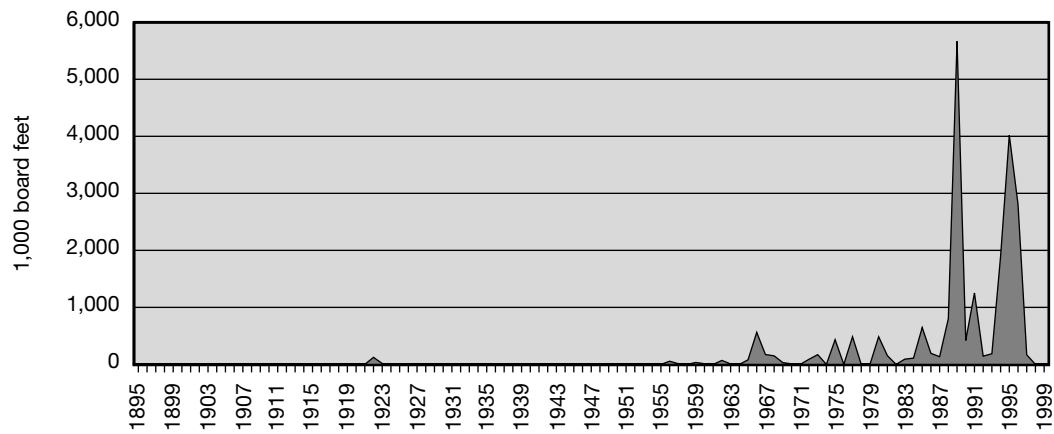


U.S. Mahogany Imports from Brazil (1895–1999)



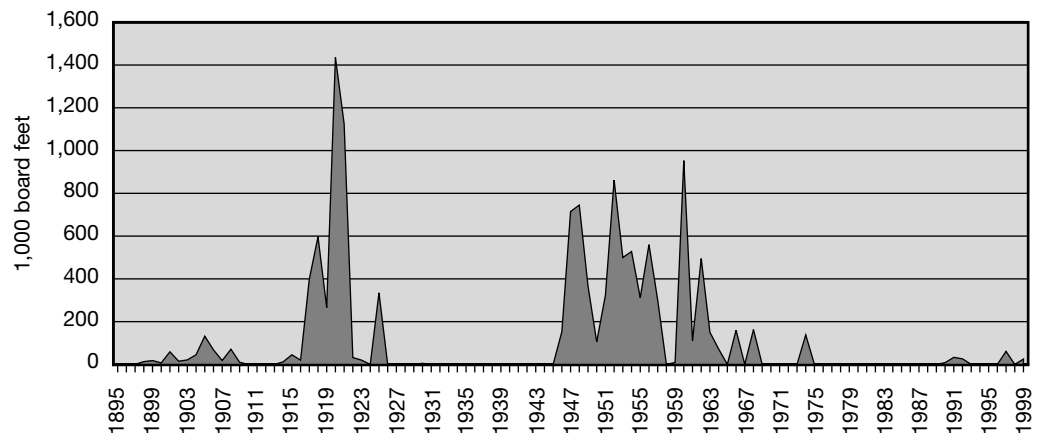
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Chile (1895–1999)



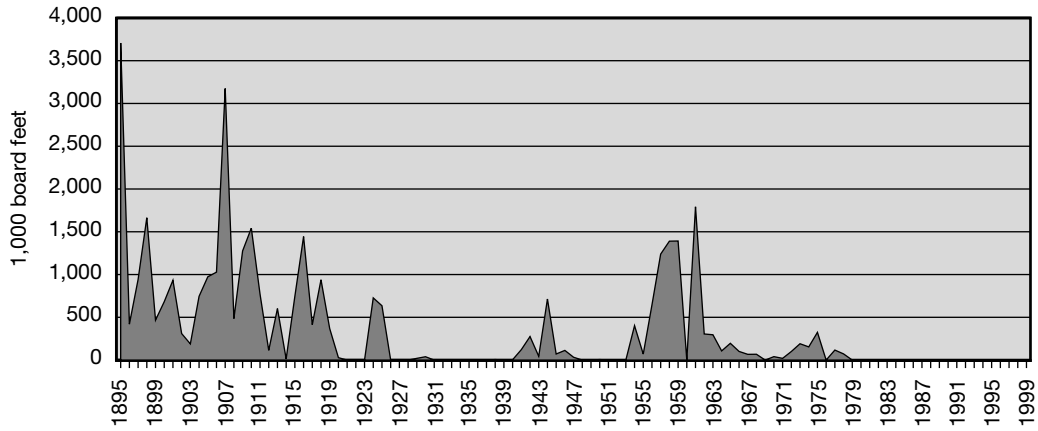
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Costa Rica (1895–1999)



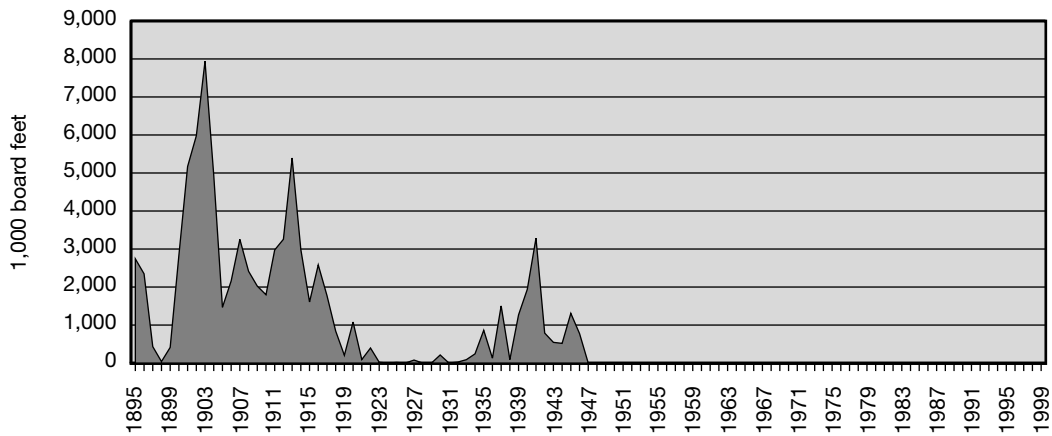
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Colombia (1895–1999)



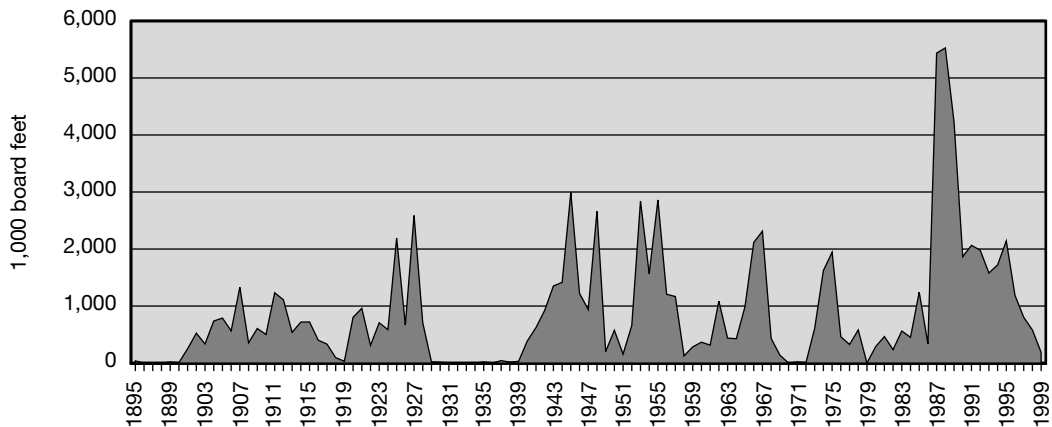
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Cuba (1895–1999)



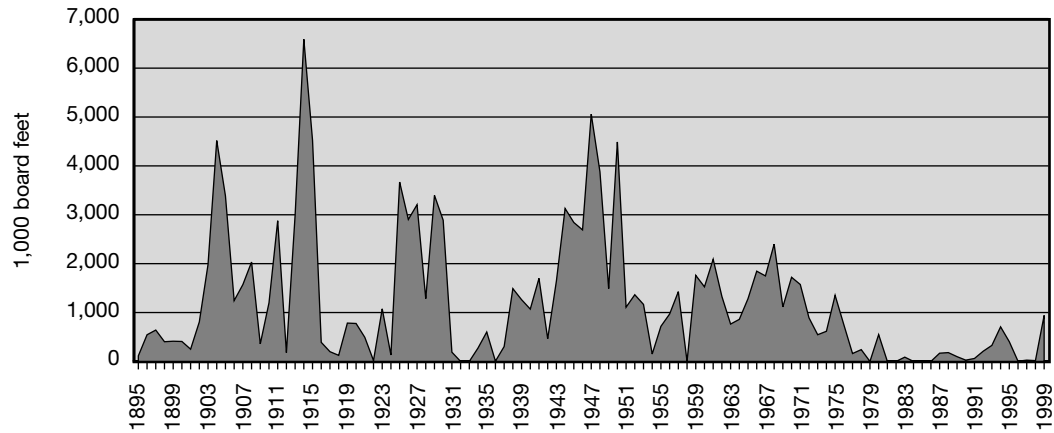
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Guatemala (1895–1999)



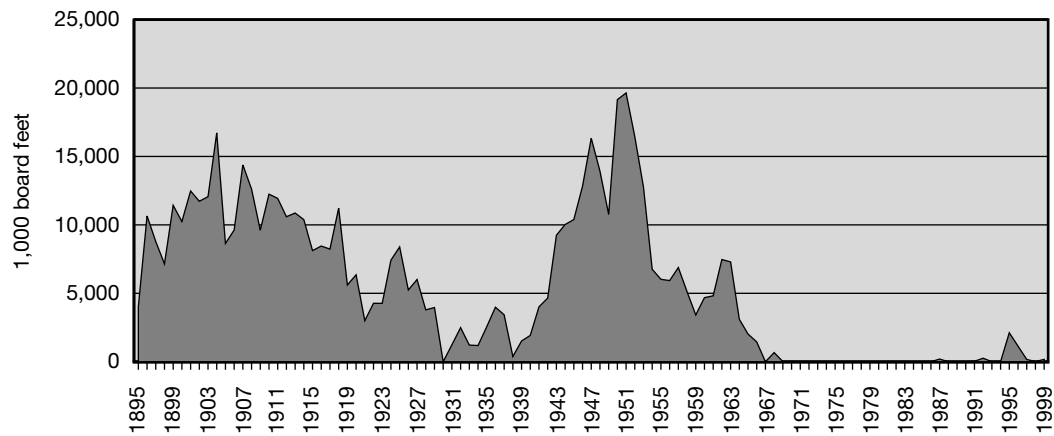
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Honduras (1895–1999)



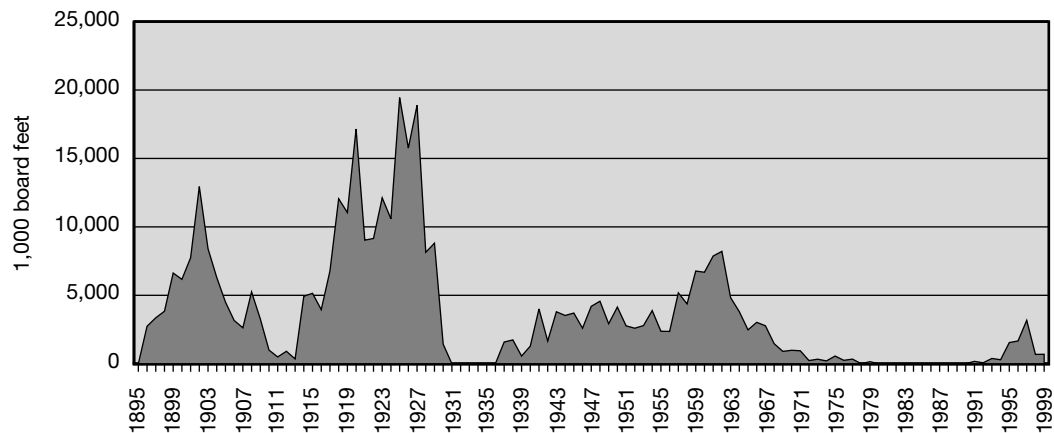
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Mexico (1895–1999)



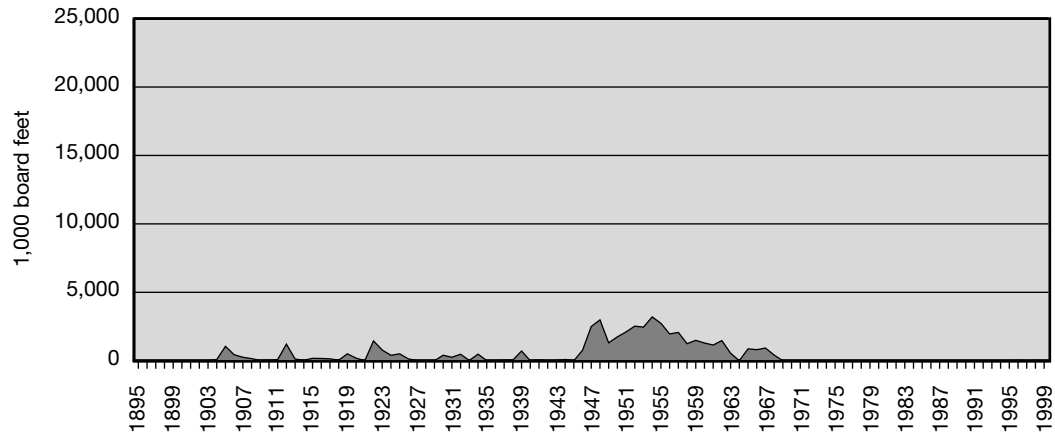
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Nicaragua (1895–1999)



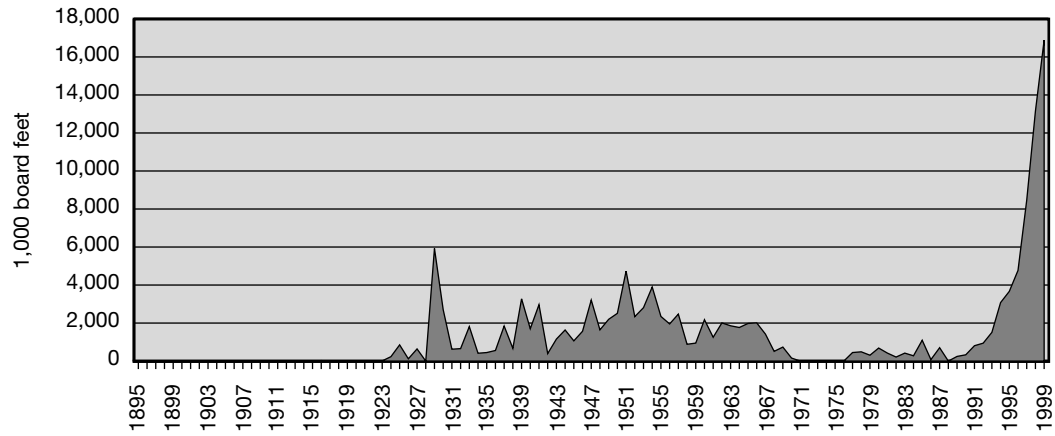
Source: U.S. International Trade Commission

U.S. Mahogany Imports from Panama (1895–1999)



Source: U.S. International Trade Commission

U.S. Mahogany Imports from Peru (1895–1999)



Source: U.S. International Trade Commission

APPENDIX 2: QUESTIONNAIRE FOR U.S. IMPORTERS OF BIG-LEAFED MAHOGANY

Big-leafed mahogany (*Swietenia macrophylla*) has received international attention in recent years. In particular, the debate surrounding the sustainability of *Swietenia macrophylla* (also known as American mahogany or caoba) within international trade has been an issue of significance to the timber industry and the environmental community. However, the dissemination of inaccurate and invalid information about the nature, extent, and impact of trade has, at times, clouded the debate and led to confusion and consternation among those involved.

TRAFFIC researches, analyzes, and distributes information on trade in wild animals and plants. The purpose of this questionnaire is to systematically compile accurate, reliable information on the U.S. trade in *Swietenia macrophylla* from the standpoint of U.S. importers. It is hoped that this information will help to clarify aspects of the U.S. mahogany trade that are misunderstood and increase the overall understanding of this trade within the industry and the environmental community.

TRAFFIC will summarize the information from this questionnaire and distribute it to those in the industry, including timber trade associations from which TRAFFIC sought technical expertise in the preparation of this survey. All recipients of this questionnaire will receive a summary of responses.

IMPORTANT: This is an *anonymous* survey. Please do not write your name, company's name, or address on the questionnaire. Individual questionnaires will be kept *confidential*. Upon completion of analysis of data, all questionnaires will be destroyed.

Please complete and return to Chris Robbins at TRAFFIC North America in the enclosed self-addressed stamped envelope by Monday, July 12, 1999.

QUESTIONNAIRE FOR U.S. IMPORTERS OF BIG-LEAFED MAHOGANY

Section A (Background)

- 1) How would you *best* describe your company's type of business?
(Circle one number only)

Lumber, veneer, plywood <i>importer</i>	1
Lumber, veneer, plywood <i>exporter</i>	2
Lumber, veneer, plywood <i>reexporter</i>	3
Lumber, veneer, plywood <i>wholesaler</i>	4
Lumber, veneer, plywood <i>retailer</i>	5
Furniture manufacturer.....	6
Furniture retailer.....	7

Other (please specify) _____

- 2) Has your company ever imported *Swietenia macrophylla* from Latin America?
(See page 3 for list of Latin American countries)

Yes	1
No	2 (Skip to #27)

- 3) How many years ago did your company first import *Swietenia macrophylla*?

Less than 1 year ago.....	1
Less than 5 years ago	2
Less than 10 years ago	3
Less than 15 years ago	4
More than 15 years ago.....	5

Section B (*Swietenia macrophylla* imports and reexports)

- 4) Did your company import *Swietenia macrophylla* in 1998?

Yes	1
No	2 (Skip to #8)

- 5) This question asks about types of *Swietenia macrophylla* mahogany products that your company may have imported from various Latin American countries in 1998. Please look at the list of Latin American countries below and circle the number (1, 2,... 5) corresponding to the product(s) of *Swietenia macrophylla* that your company imported from each country in 1998. If your company did not import any of the *Swietenia macrophylla* products from these countries in 1998, please place a check in the last column under “**Did not import from country.**”

	Sawn Logs	Sawn Wood	Veneer	Plywood	Furniture	Did not import from country
a) Argentina	.....1	.....2	.....3	.....4	.....5	_____
b) Belize	.....1	.....2	.....3	.....4	.....5	_____
c) Bolivia	.....1	.....2	.....3	.....4	.....5	_____
d) Brazil	.....1	.....2	.....3	.....4	.....5	_____
e) Chile	.....1	.....2	.....3	.....4	.....5	_____
f) Colombia	.....1	.....2	.....3	.....4	.....5	_____
g) Costa Rica	.....1	.....2	.....3	.....4	.....5	_____
h) Dom. Rep.	.....1	.....2	.....3	.....4	.....5	_____
i) El Salvador	.....1	.....2	.....3	.....4	.....5	_____
j) Ecuador	.....1	.....2	.....3	.....4	.....5	_____
k) Guatemala	.....1	.....2	.....3	.....4	.....5	_____
l) Fr. Guiana	.....1	.....2	.....3	.....4	.....5	_____
m) Guyana	.....1	.....2	.....3	.....4	.....5	_____
n) Honduras	.....1	.....2	.....3	.....4	.....5	_____
o) Mexico	.....1	.....2	.....3	.....4	.....5	_____
p) Nicaragua	.....1	.....2	.....3	.....4	.....5	_____
q) Panama	.....1	.....2	.....3	.....4	.....5	_____
r) Paraguay	.....1	.....2	.....3	.....4	.....5	_____
s) Peru	.....1	.....2	.....3	.....4	.....5	_____
t) Suriname	.....1	.....2	.....3	.....4	.....5	_____
u) Venezuela	.....1	.....2	.....3	.....4	.....5	_____
v) Uruguay	.....1	.....2	.....3	.....4	.....5	_____

- 6) What was the approximate volume of *Swietenia macrophylla* that your company imported in 1998? (*Circle one number only*)

Up to 100 cubic meters (appx. 29,000 board ft)	.....1
Up to 300 cubic meters (appx. 86,000 board ft)	.....2
Up to 500 cubic meters (appx. 144,000 board ft)	.....3
Up to 700 cubic meters (appx. 201,000 board ft)	.....4
Up to 900 cubic meters (appx. 259,000 board ft)	.....5
Up to 1,100 cubic meters (appx. 316,000 board ft)	.....6
More than 1,300 cubic meters (appx. 374,000 board ft)	.....7
Don't know	.....9

- 7) Please look at the list of various *Swietenia macrophylla* products below. Think about your company's imports of sawn logs, sawn wood, veneer, plywood, or furniture over the last 10 years. Were your company's 1998 imports of any of these products **lower than 10 years ago**, **higher than 10 years ago**, or **about the same as 10 years ago**?
(Circle all that apply)

	Lower than 10 yrs. ago	Higher than 10 yrs. ago	About the same as 10 yr. ago	Did not import in 1998	Don't Know
a) Sawn logs	1	2	3	4	9
b) Sawn wood	1	2	3	4	9
c) Veneer	1	2	3	4	9
d) Plywood	1	2	3	4	9
e) Furniture	1	2	3	4	9

- 8) Did your company reexport *Swietenia macrophylla* from the United States in 1998?

No1 (Skip to Section C)
Yes2 (Go to 8a)

- 8a) To what country did your company reexport *Swietenia macrophylla* in 1998?
(Circle all that apply)

a) Argentina1
b) Canada.....2
c) France3
d) Netherlands4
e) Germany5
f) Japan6
g) United Kingdom7
h) Other (specify) _____

Section C (Changes in U.S. price/demand for *Swietenia macrophylla*)

- 9) How would you characterize the change in wholesale price of *Swietenia macrophylla* versus other timber species, including their products, today as compared to 10 years ago?
(Circle one response option only)

Significantly lower1
Moderately lower2
More or less stable3
Moderately higher4
Significantly higher5

- 10) Have purchases of (demand for) *Swietenia macrophylla* from your company **decreased**, **increased**, or **remained stable** in the past 10 years?

Decreased1
Increased.....2 (Skip to #12)
Remained stable3 (Skip to Section D)

11) Why do you believe purchases of (demand for) *Swietenia macrophylla* from your company have *decreased* in the past 10 years?
(Circle all that apply)

- a) Declining U.S. consumer interest1
- b) Economic slowdown in United States2
- c) Higher tariffs on mahogany imports3
- d) Increased pressure from conservation community4
- e) More international trade controls5
- f) Increased competition with cheaper species/sources of wood6
- g) Don't know9

Other reason(s) (Please specify)

- 1) _____
- 2) _____

When Finished with #11, Skip # 12 and Go to Section D

12) Why do you believe purchases of (demand for) *Swietenia macrophylla* from your company have *increased* in the past 10 years?
(Circle all that apply)

- a) Growing U.S. consumer interest1
- b) Improved U.S. economy2
- c) Lower tariffs on mahogany imports3
- d) Decreased pressure from conservation community4
- e) Fewer international trade controls5
- f) Decreased competition with cheaper species/sources of wood6
- g) Don't know9

h) Other reason(s) (Please specify)

- 1) _____
- 2) _____

Section D (Changes in availability or supply of *Swietenia macrophylla*)

13) Compared to 10 years ago, has your company noticed a change in its ability to obtain or maintain a reliable supply of *Swietenia macrophylla*?

- Yes1
- No.....2 (Skip to Section E)
- Don't know3 (Skip to Section E)

14) Would you describe these changes as having a positive, negative, or no apparent effect on your company's ability to obtain or maintain a reliable supply of *Swietenia macrophylla*?

- Positive1 (Skip to #16)
- Negative2 (Answer #15, then skip to Section E, #17)
- No apparent effect.....3 (Skip to Section E)

15) How has your company reacted to changes that have had a negative effect on its ability to obtain or maintain a reliable supply of *Swietenia macrophylla*? (Circle all that apply)

- a) Reduced overall inventory and imports of mahogany1
- b) Identified new suppliers in country where you usually purchase mahogany2
- c) Imported new and different species to offset lower supply of mahogany3
- d) Imported mahogany from different countries that you don't usually import from.....4
- e) Increased price of mahogany to domestic buyers, mills, and manufacturers5
- f) Other (please specify) _____

16) How has your company reacted to changes that have had a positive effect on its ability to obtain or maintain a reliable supply of *Swietenia macrophylla*? (Circle all that apply)

- a) Increased inventory and imports of mahogany1
 - b) Lowered price of mahogany to domestic buyers, mills, and manufacturers.....2
 - c) Increased imports of mahogany from countries that you don't usually import from3
 - d) Other (please specify) _____
- _____

Section E (Changes in quality of *Swietenia macrophylla*)

17) The next question asks about the importance of certain traits that contribute to the quality of *Swietenia macrophylla*, whether you have noticed any changes in these traits in recent years, and whether these changes have had positive, negative, or no effect on sales to buyers.

*It is understandable and even to be expected that the quality of **Swietenia macrophylla** might vary from one buyer to the next according to personal preference. We also recognize that changes in quality are not necessarily related to changes in availability.*

Please indicate whether each trait has **low**, **medium**, or **high** importance, particularly as it contributes to end-product value. Then, please indicate whether you have observed any changes (**yes** or **no**) in each trait in recent years, and whether you believe these changes have had a **positive**, **negative**, or **no** impact on sales to buyers, manufacturers, etc.

Trait	Rate importance of trait as "low" "medium" or "high"			Observed changes in traits in recent years		Impact(s) of observed changes in traits on sales to buyers		
	low (✓)	medium (✓)	high (✓)	yes (✓)	no (✓)	positive (✓)	negative (✓)	none (✓)
a) tension wood (fuzzy wood)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) color	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) density	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) straightness of grain in sawn wood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) stability or shrinkage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) workability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) drying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) resistance to decay fungi	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section F (Level and burden of *Swietenia macrophylla* trade documentation)

18) Has the amount of paperwork associated with your imports of *Swietenia macrophylla* **decreased**, **remained the same**, or **increased** for your company over the last few years?

- Decreased1 (Skip to Section G)
- Remained the same2 (Skip to Section G)
- Increased.....3
- Don't know9 (Skip to Section G)

19) Which of the following factors listed below do you think are responsible for an increase in paperwork associated with imports of *Swietenia macrophylla* over the last few years? (Circle all that apply)

- a) Federal phytosanitary requirements1
- b) CITES Appendix III listing.....2
- c) Federal Customs declaration requirements.....3
- d) Don't know9

e) Other (please specify): _____

20) Has the increase in amount of paperwork associated with importing *Swietenia macrophylla* over the last few years posed **no burden**, **minimal burden**, **moderate burden**, or **excessive burden** to your company?

- No burden1
- Minimal burden2
- Moderate burden.....3
- Excessive burden4
- Don't know9

Section G (Certified *Swietenia macrophylla*)

21) Has your company ever imported certified *Swietenia macrophylla*? By certified mahogany, we mean mahogany that has come from forests certified for sustainable management by certifying organizations (ISO, SFI, FSC, etc.).

- Yes1
- No2 (Skip to #24)
- Don't know9 (Skip to Section H)

22) Please indicate the name(s) of the certifying entity or body from which you have obtained certified *Swietenia macrophylla*?

23) From which country(ies) has your company imported certified *Swietenia macrophylla*?

Please specify: _____

If You Answered #23, Skip to Section H, #25

- 24) What are your main reasons for **not having imported** certified *Swietenia macrophylla*?
(Circle all that apply)
- a) Lack of information on sources of certified mahogany1
 - b) Lack of demand from U.S. manufacturers2
 - c) High price, no economic incentive3
 - d) Lack of available sources of certified mahogany4
 - e) Do not agree with certification on philosophical grounds.....5
 - f) Noncertified sources of mahogany
are more plentiful, less expensive6
 - g) Do not have an opinion.....9

Section H (Plantation-grown *Swietenia macrophylla*)

- 25) Has your company ever imported plantation-grown *Swietenia macrophylla* from Latin America or the Caribbean?
- Yes1
 - No2 (Skip to #27)
 - Don't know9 (Skip to #27)

- 26) From which Latin American or Caribbean country(ies) has your company imported plantation-grown *Swietenia macrophylla* in the past? (Circle all that apply)

- a) Belize.....1
- b) Bolivia.....2
- c) Brazil3
- d) Colombia.....4
- e) Costa Rica5
- f) Guatemala.....6
- g) Honduras7
- h) Martinique.....8
- i) Mexico9
- j) Nicaragua10
- k) Peru11
- l) Puerto Rico12
- m) Venezuela13

Other (specify) _____

- 27) Has your company ever imported plantation-grown *Swietenia macrophylla* from **outside** of Latin America and Caribbean?
- Yes.....1
 - No2 (Skip to end of questionnaire)
 - Don't know9 (Skip to end of questionnaire)

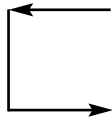
28) From which country(ies) **outside** of Latin America and Caribbean has your company imported plantation-grown *Swietenia macrophylla*? (Circle all that apply)

- a) Fiji1
- b) India2
- c) Indonesia3
- d) Malaysia.....4
- e) Philippines.....5
- f) Solomon Islands6
- g) Sri Lanka.....7

Other (specify) _____

29) Are there any differences in quality between *Swietenia macrophylla* that comes from plantations versus from natural forests?

- No1
- Yes2



Briefly describe these differences in quality:

Thank you for your input.



IUCN
The World Conservation Union

The TRAFFIC Network is the world's largest wildlife trade monitoring program with offices covering most parts of the world. TRAFFIC is a program of WWF-World Wildlife Fund and IUCN-The World Conservation Union, established to monitor trade in wild plants and animals. It works in close cooperation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The TRAFFIC Network shares its international headquarters in the United Kingdom with the World Conservation Monitoring Centre.

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