

Mahogany and CITES: moving beyond the veneer of legality

Arthur G. Blundell and Bruce D. Rodan

Abstract The genuine mahoganies (*Swietenia* spp., Meliaceae) are the most valuable timber species in Latin America. Only one species, bigleaf mahogany *S. macrophylla*, is still traded. Because of concerns regarding logging it is regulated under Appendix III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). We analyze implementation of CITES regulations by the USA, which is the major importer, comparing CITES statistics with data from US Customs to determine if shipments entering the USA have proper CITES documentation. Based on summary data for 1997–1999 (the most recent available), US Customs reports substantially more mahogany imports than CITES, although >90% of imports were accompanied by the proper CITES documents. The discrepancies resulted from (1) changes in shipment volume made after permits were issued, (2) data transcription and unit conversion errors, (3) mistaken inclusion of other species in Customs data, and (4) imports

that might or might not have been accompanied by the appropriate CITES documents. The analysis demonstrates that the USA is properly implementing CITES requirements. However, mahogany may be smuggled under different species names. Furthermore, the numerous credible reports of widespread illegal mahogany logging suggest that a substantial proportion of US imports might have been obtained in a manner inconsistent with the domestic laws of the exporting countries. Thus illegally obtained mahogany might have been 'legalized' through the CITES process, with Appendix III providing a veneer of legality to what is otherwise illegal wood.

Keywords Illegal trade, logging, mahogany, *Swietenia macrophylla*, trade statistics, tropical timber species.

This paper contains supplementary material that can only be found online at <http://journals.cambridge.org>

Introduction

Bigleaf mahogany (*Swietenia macrophylla* King, Meliaceae) is the premier neotropical timber species, highly valued for its beauty, workability and resistance to rot. A canopy-emergent tree, it occurs at very low densities, predominantly in the seasonally dry tropical forests from Mexico through Central America to the southern Amazon in Peru, Bolivia and Brazil (Lamb, 1966). Because of its high value (c. US \$1,300 m⁻³; ITTO, 2002) mahogany is harvested throughout its range both legally and illegally. Six countries have unilaterally listed bigleaf mahogany in CITES Appendix III to help place trade on a legal basis (Costa Rica in 1995, Mexico in 1998, Bolivia in 1998, Brazil in 1998, Peru in 2001, and

Colombia in 2001). These countries must ensure that domestic measures to protect the species are in place, that all exports are legally obtained (CITES Article V.2), and that shipments are accompanied by a CITES export permit. All other countries must also track trade, and their shipments must be accompanied by a certificate of origin. Importing countries are obliged to ensure that all shipments are accompanied by the appropriate documentation. In this paper we examine whether importer obligations under CITES Appendix III are being implemented by the USA, which accounts for approximately 60% of world trade in mahogany (Robbins, 2000).

For 1997–1999, the most recent years available, we compared statistics from the US Customs Service (Department of the Treasury), the US CITES Management Authority (Fish & Wildlife Service, Department of the Interior), exporter data from the UNEP-World Conservation Monitoring Centre (which provides a trade-monitoring service to CITES) and from the International Tropical Timber Organization (a UN-chartered commodity organization of countries that produce and consume tropical timber). We included only trade from countries where bigleaf mahogany occurs naturally, i.e. range states. Mahogany is also exported from Asia

Arthur G. Blundell¹ (Corresponding author) and Bruce D. Rodan US Environmental Protection Agency, Office of Research & Development, National Center for Environmental Assessment, 1200 Pennsylvania Ave NW, Mail Stop 8601 D, Washington, DC 20460, USA.

¹Present address: AAAS Fellow, EGAT Forest Team, US Agency for International Development, 3426 16th St NW #308, Washington, DC 20010, USA. E-mail: art.blundell@alum.dartmouth.org

Received 21 November 2001. Revision requested 10 May 2002. Accepted 23 May 2002.

(plantation grown) and from Africa (other genera of Meliaceae, not *Swietenia* spp.), but we excluded these because their shipments do not require CITES documents. Although shipments of mahogany logs, veneer, and sawn wood all require CITES documentation, we focus on sawn wood because trade of the first two appears to be relatively minor (Robbins, 2000). Both US Customs and the US CITES Authority independently collect data on mahogany imports (Appendix 1). The US Customs Service reports all sawn wood shipments under Harmonized Tariff Schedule (HTS) codes specific to mahogany (4407240030 and 4407240025). Theoretically, therefore, each shipment in the CITES database should have an identical record in the Customs database, and *vice versa*.

Overall trade

For 1997–1999 US Customs reported annual imports of c. 100,000 m³ (Fig. 1), up from 60,000 m³ earlier in the twentieth century (Robbins, 2000). An annual harvest of 57,000 mahogany trees is estimated to be necessary to supply the US furniture trade (Robbins, 2000). Trade from exporting countries indicates a pattern of local depletion and shifting supply. Central America was once the major source of mahogany (Robbins, 2000), but now it is responsible for <10% of US imports (Fig. 2). Exports from Bolivia have also declined, whereas exports from Peru have increased (Fig. 2). In Bolivia, the decreasing availability of commercial mahogany is principally due to overexploitation (TRAFFIC, 2001).

The majority (>75%) of trade was conducted by <10% of the companies: 56 exporters and 10 US importers. Concurrent with the sharp decline in trade, only 41% of Bolivian companies shipped mahogany in each of the 3 years. Likewise, in Peru, only 35% of

companies consistently traded mahogany. Turnover was even higher in Brazil (only 30% of companies shipped in all 3 years), which may indicate an inability to maintain mahogany supply at the local scale.

Discrepancies among country reports

In 1997 the CITES authorities of range states reported a substantially lower volume of mahogany sawn wood exports to the USA than were reported as imports by US CITES (Fig. 1). This occurred because only two range states submitted trade reports, and their reports did not agree with US CITES data: Mexico reported 164% and Nicaragua 23% more volume in trade than was reported by US CITES (Fig. 2). The total discrepancy decreased in 1998 (Fig. 1) because Brazil began reporting. However, Brazil's reported exports were 20% less than US import reports (Fig. 2). In 1999 two more countries, Bolivia and Guatemala, reported data, but because Peru, another major exporter, did not report, the total discrepancy was still 31% (Fig. 1).

The International Tropical Timber Organization did not report any mahogany imports to the USA (ITTO, 2000). Few countries (<20%), including the USA, reported in a timely fashion to the ITTO, and some major producers (including Brazil) did not report at all. This highlights the shortcomings of summary figures when national data are not available for inclusion.

Even when all countries submit trade data, reports from producers and consumers may differ for several reasons. Exporters must obtain CITES documents prior to shipment and, because the process can be time-consuming, they often request permits before the mahogany is available for export. Occasionally, documents may be issued for mahogany that is never shipped. In contrast, the USA only reports mahogany that is imported. In this case exporting country totals would be greater than the USA's import records, a trend that we found seven out of nine times that range states reported (Fig. 2).

Another factor generating discrepancies is that exporters record the date the CITES document was issued, whereas importers record the date the shipment cleared customs. To explore this, Bolivia's CITES permits were compared with those reported by the USA. As expected, a number of permits were issued by Bolivia in December but the shipments did not arrive until the new year. Thus, Bolivia listed the shipments in one calendar year and the USA in the next. This problem is exacerbated because disproportionately more mahogany enters the USA between October and January (Fig. 3). This is because the mahogany trade has a cyclical pattern, resulting from logging that coincides with the dry season, when it is easiest to drag logs from the forest.

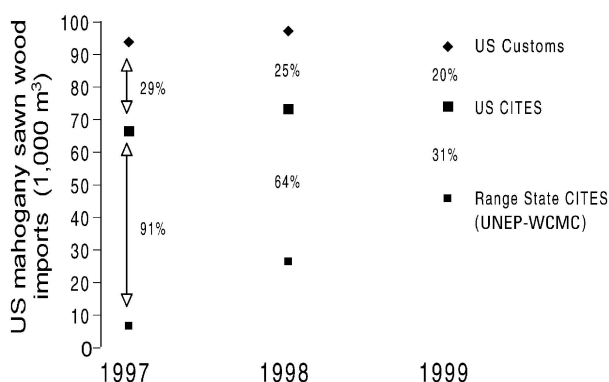


Fig. 1 Volume (1,000 m³) of sawn mahogany imported to the USA between 1997 and 1999. Percentages represent the discrepancy between three reporting authorities: US Customs, US CITES Authority, and UNEP-World Conservation Monitoring Centre export reports by the CITES Authorities of range states.

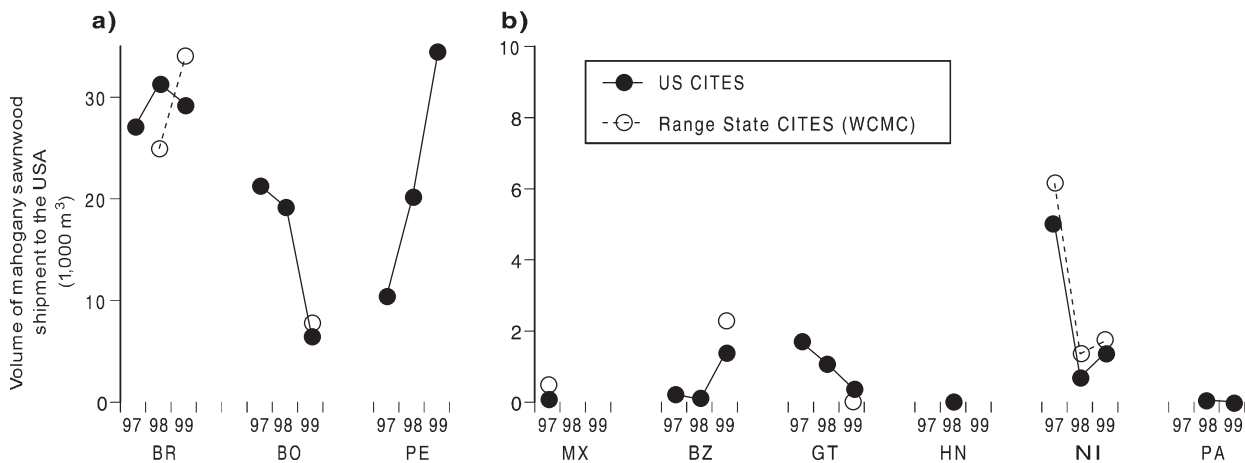


Fig. 2 Volume (1,000 m³) of sawn mahogany shipments to the USA, as reported by the CITES Management Authorities of the USA and range states. Each range state has up to three reports, representing trade in the years 1997–1999. a) Shipments from South America (BR, Brazil; BO, Bolivia; PE, Peru), and b) Mexico (MX) and Central America (BZ, Belize; GT, Guatemala; HN, Honduras; NI, Nicaragua; PA, Panama). Note the different scales in the y-axis of a) and b). An unpaired bar indicates the failure of a range state to report trade. The first four range states all list mahogany on CITES Appendix II and require export permits that verify that the shipments were legally obtained; the remaining range states must also track trade and provide certificates of origin with all shipments.

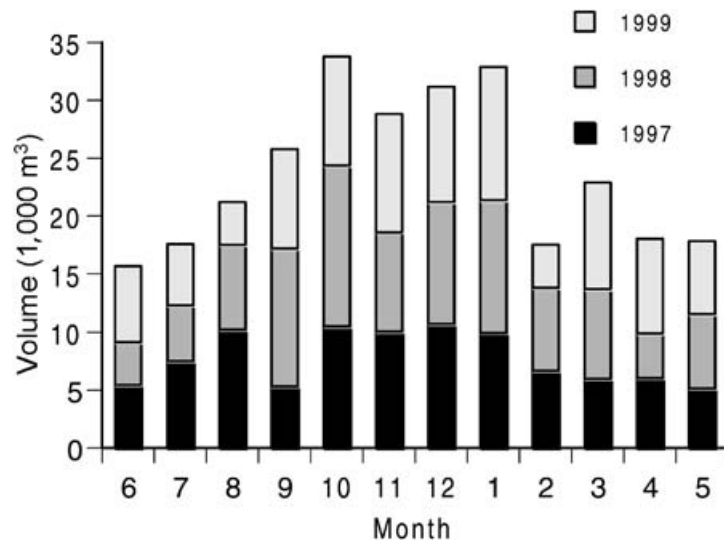


Fig. 3 Temporal pattern (June–May) of sawn mahogany imports to the USA during 1997–1999 (data from US Customs).

Discrepancies between US CITES and US Customs

In order to determine the cause of the large discrepancies between US Customs and US CITES (Fig. 1), shipments in the two databases were matched on country of origin, month of entry, shipment volume, and importing company. In any given year, at best 36% of the volume of Customs shipments matched perfectly with those in the CITES database (Fig. 4). After allowing for partial matches (Fig. 4 & Appendix 2), 24–34% of Customs shipments had no match in the CITES records and 11–33% of CITES shipments did not appear in the Customs database (Fig. 4).

To further explore these residual discrepancies, we examined the original paperwork (manifests/bills-of-lading) for 33 randomly chosen shipments from 1999 that had been reported by Customs but were, apparently, unreported by CITES ('unmatched' category in Fig. 4). Of the 33, one *Carapa guianensis* Aubl. (Meliaceae) shipment was misclassified in the Customs database as mahogany. Eight shipments were unmatched because the exporting CITES authorities or US Customs had incorrectly recorded shipment volume, presumably because the shipment size changed after the permit had been issued. Such errors also occurred because of differences in the convention used for decimal points (i.e. a comma versus a period); for example, 69,000 means

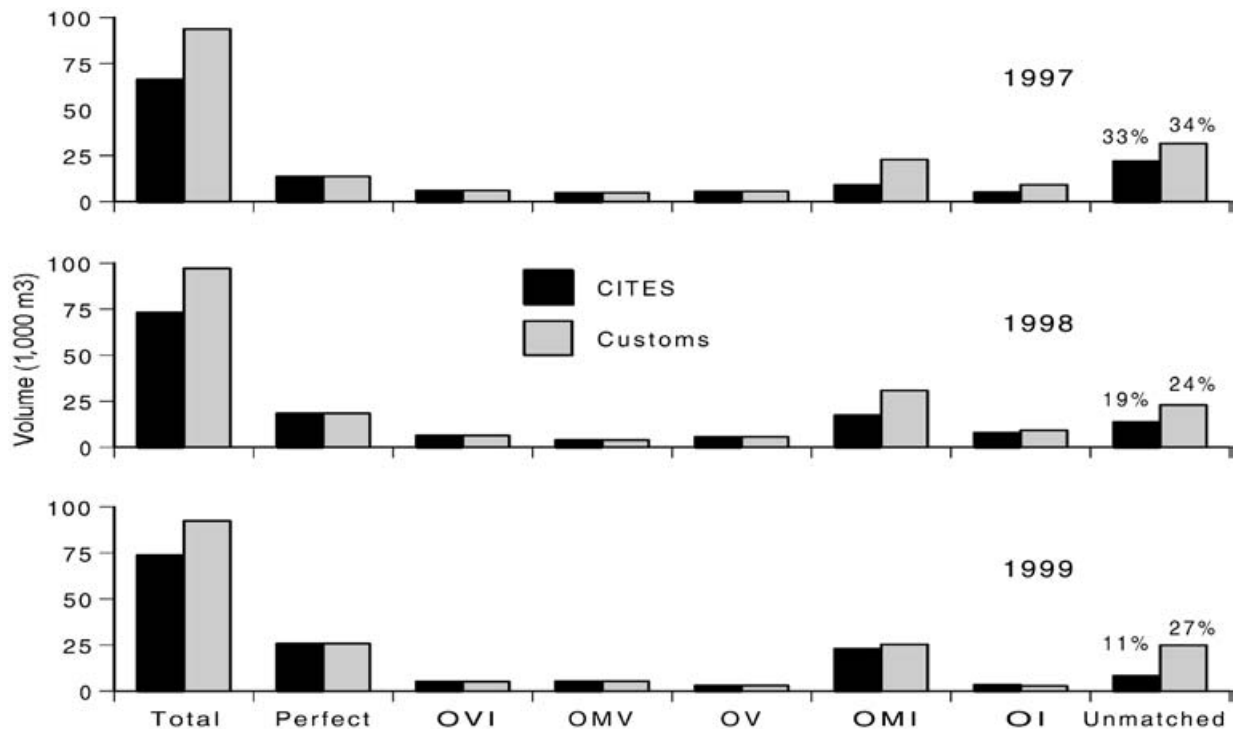


Fig. 4 Matches of records between databases that reported US imports (volume, 1,000 m³) of sawn mahogany for 1997–1999: US CITES and US Customs. The pair of bars at the extreme left of each panel represents the total volume reported by CITES and Customs. Matches between the two databases were based on country of origin (O), shipment volume (V), importing company (I), and month of entry (M). ‘Perfect’ represents records that matched on all four criteria. The pair of bars at the extreme right of each panel represent the volume of mahogany in each database that had no apparent match. All other pairs represent matches that were made by relaxing the criteria. For example, ‘OVI’ represents shipments that could be matched on origin (O), volume (V), importer (I), but not on month of entry (M).

sixty-nine thousand in North America, but 69 with three decimal places in some Latin American countries. Eight shipments had CITES documents, but they had not been recorded by the US CITES Management Authority. Of the 33 shipments, only 16 were for mahogany that had either entered the US without the appropriate CITES permits, or if CITES permits were issued, they did not reach the US CITES Management Authority. Thus, the actual mismatch between US Customs and CITES (approximately 10% of volume) is less than Fig. 1 suggests.

Eliminating reporting discrepancies

Some discrepancies can be corrected bilaterally or by UNEP-WCMC by matching records from exporters with importer reports across different calendar years. Such reconciliation would allow range states to track permits and determine which were issued but never used. This information is important to allow countries to determine whether domestic quotas were met or exceeded. However, any such *post hoc* analysis requires that all countries submit detailed reports that include permit numbers.

Cross-referencing permit numbers from individual shipments would also identify CITES permits that had been issued inappropriately or falsified. For example, more than 40 export documents for 1998 imports to the US were not issued by the proper CITES Management Authorities (Robbins, 2000). Likewise, none of the CITES export permits sent to Canada in 1999 from Brazil or Peru were validated by officials prior to export (Gerson, 2000).

If the HTS code for a shipment of mahogany is misclassified then Customs cannot track the shipment as mahogany and it would enter as a CITES shipment with no Customs match, or with no record whatsoever as mahogany (e.g. smuggled). In Canada, Gerson (2000) found that *c.* 60% of mahogany shipments were not reported in the correct codes for mahogany, but were misreported in categories for generic tropical wood. Given these difficulties in detecting smuggled or mislabelled mahogany, the true size of the illegal trade may be larger than the discrepancies reported here. For example, there are anecdotal reports suggesting that mahogany is entering Puerto Rico as ‘louro vermelho’ and ‘andiropa’. Unfortunately, it is difficult for Customs

and CITES officers to identify mislabelled or smuggled mahogany because timber species are not readily distinguishable. Sawn wood lacks the leaves, bark, and flowers that botanists generally use for unambiguous identification. These difficulties not only complicate tracking legal trade, but can be exploited by illegal traders.

Discussion

The US government has implemented a number of steps to improve domestic reporting. In 1999 a manual was distributed to the designated ports of entry for CITES timber to increase awareness about the Appendix III protocol for mahogany (available at <http://www.aphis.usda.gov/ppq/manuals>). In 2000, US Customs modified their software so that a message automatically notifies the officer to check that the shipment is mahogany and not to release the shipment prior to CITES approval.

Reconciling Customs and CITES records would be further expedited if CITES Authorities recorded Customs entry numbers so that shipments could be easily matched between agency databases. An additional step recommended by Gerson (2000) to Canada Customs was to create HTS codes for timber species easily confused with genuine Latin American mahogany, e.g. the African mahoganies, Spanish cedar (*Cedrela* spp., Meliaceae), and lignum-vitae (*Guaiacum* spp., Zygophyllaceae).

Overall, CITES Appendix III is being properly implemented by the USA; we estimate that more than 90% of *S. macrophylla* shipments are accompanied by CITES documents. In contrast to this encouraging news are the increasing reports of widespread illegal mahogany logging. According to the CITES text, an export permit confirms that the shipment was legally obtained. Thus, to be in accordance with Appendix III obligations, a mahogany shipment must be in compliance with domestic laws. Published reviews indicate that almost no mahogany is well-managed and most is illegal because logging failed to comply with management plans (Gullison, 1995; Snook, 1996; Grogan *et al.*, 2002) or had no plans at all and was logged from parks or indigenous reserves (Verissimo *et al.*, 1995; Hering & Tanner, 1998; Greenpeace, 2001; Zimmerman *et al.*, 2001).

In Brazil in 1999, for example, IBAMA (the Brazilian agency responsible for forestry) reviewed the 31 management plans for mahogany in the State of Pará and suspended 29 as inadequate (IBAMA, 2000). This repeated a 1996 finding by IBAMA that only 21 out of 95 mahogany operations even had management plans (Hering & Tanner, 1998). Yet during this time Brazil exported >100,000 m³ of mahogany (Fig. 2). This illegal logging continues. Greenpeace (2001) documented widespread illegal logging, and IBAMA raided one sawmill

and seized c. 7,000 m³ of mahogany obtained illegally from indigenous reserves. As a result of this extensive illegal activity, IBAMA then suspended all management plans for mahogany in the States of Pará, Mato Grosso and Acre, other than certified operations (Instrução Normativa N° 22, de 05 de Dezembro de 2001), a policy recently confirmed by President Cardoso (2002).

One possible solution to limit trade in illegal mahogany would be for US importers to insist on independent verification that their purchases were obtained legally and not from parks, reserves, or concessions that failed to implement regulations. Such verification requires tracking timber from stump through milling to export, i.e. maintaining a chain of custody.

The reports of illegal logging suggest that a substantial proportion of US imports during 1997–1999 were obtained in a manner inconsistent with the domestic laws of the range states. This means that illegally obtained timber might have been 'legalized' during international trade through the awarding of CITES Appendix III export permits, under a treaty designed to protect the species. Within importing countries it is not unreasonable for consumers to rely on government-sanctioned documents attesting to the legal nature of a product. Thus, it is ironic that CITES Appendix III export permits that are improperly awarded to illegally obtained mahogany may be providing a false sense of security to purchasers who believe they are buying legal wood.

Acknowledgements

This analysis was made possible by Julie Lyke and Mark Albert of the Fish and Wildlife Service and Jan McAlpine of the State Department. Customs data was provided by Trang Van Le, Carla D'Onofrio, and Lynette Carter. US CITES data was provided by Mark Albert. WCMC data was provided by John Caldwell. APHIS information was provided by Bud Petit de Mange. We thank Dr. Shirlee Tan for commenting on the manuscript. Disclaimer: The opinions expressed in this paper do not necessarily represent United States government policy.

References

- Cardoso, F.H. (2002). National radio address on mahogany by Brazilian President Fernando Henrique Cardoso, 9 April 2002. http://www.brasilemb.org/environ_mahogany_fhc.shtml [accessed 11 June 2002].
- Gerson, H. (2000) *An Investigation of the Tropical Timber Trade in Canada with Emphasis on the Compliance, Reporting and Effectiveness of Legislation and Regulatory Procedures for CITES-listed Timber Species*. Canada Customs and Revenue Agency Report, Ottawa, Canada.

- Greenpeace (2001) *Partners in Mahogany Crime*. Greenpeace International, Amsterdam, The Netherlands.
- Grogan, J., Barreto, P. & Verissimo, A. (2002) *Mahogany in the Brazilian Amazon: Ecology and Perspectives on Management*. Imazon, Belem, Brazil.
- Gullison, R.E. (1995) *Conservation of tropical forests through the sustainable production of forest products: The case of mahogany in the Chimanes Forest, Beni, Bolivia*. PhD thesis. Princeton University, Princeton, USA.
- Hering, R. & Tanner, S. (1998) *Plunder for Profit: the UK and Brazilian Mahogany Trade*. FOE, London, UK.
- IBAMA (2000) ITTO Project Proposal PD 50/00 Rev. 1 (F). Brasilia, Brazil.
- ITTO (2000) *Annual Review and Assessment of the World Timber Situation 1999*. ITTO, Yokohama, Japan.
- ITTO (2002) *Tropical Timber Market Report April 2002*. ITTO, Yokohama, Japan.
- Lamb, F.B. (1966) *Mahogany of Tropical America: its Ecology and Management*. University of Michigan, Ann Arbor, USA.
- Robbins, C. (2000) *Mahogany Matters: the US Market for Big-leafed Mahogany and its Implications for the Conservation of the Species*. TRAFFIC North America, Washington, DC, USA.
- Snook, L. K. (1996) Catastrophic disturbance, logging and the ecology of mahogany (*Swietenia macrophylla* King): grounds for listing a major tropical timber species in CITES. *Botanical Journal of the Linnean Society*, **122**, 35–46.
- TRAFFIC (2001) *Big-leafed Mahogany and CITES*. Briefing for CITES Mahogany Working Group, Santa Cruz, Bolivia. TRAFFIC Network, October 2001, Quito, Ecuador.
- Verissimo, A., Barreto, P., Tarifa, R. & Uhl, C. (1995) Extraction of a high-value natural resource in Amazonia: The case of mahogany. *Forest Ecology and Management*, **72**, 39–60.
- Verissimo A. & Grogan, J. (1998) *Meeting of the Working Group on Mahogany: Synthesis of the Situation of Mahogany At International Level*. Inf. Rep. Nr. 02-98-English. MMA-FAO-PNUD, Brasilia, Brazil.
- Zimmerman, B.L., Peres, C.A., Malcolm, J.R. & Turner, T. (2001) Conservation and Development Alliances with the Kayapó of Southeastern Amazonia, a Tropical Forest Indigenous People. *Environmental Conservation*, **28**, 10–22.

Biographical sketches

Dr. Art Blundell is an American Association for the Advancement of Science Diplomacy Fellow with the Forestry Team, USAID. His doctoral research was on the population ecology of the canopy family Dipterocarpace in Indonesian Borneo. Currently he is working on the use of biocides in forestry, and international policy to reduce illegal logging.

Dr. Bruce Rodan is a research medical officer and senior scientist at the US Environment Protection Agency, advancing domestic and international environmental issues and the integration of human health and ecosystem research.

Appendices 1–2

Appendices 1 and 2 for this article are available online at <http://journals.cambridge.org>

Postscript

Since this paper was completed, the 12th Conference of Parties to CITES met in Santiago, Chile, on 3–15 November 2002. The Parties voted (68 to 30, with 14 abstentions) to ‘uplist’ mahogany from CITES Appendix III to Appendix II, based on a proposal from Guatemala and Nicaragua. Appendix II listing requires exporting countries to verify that each shipment was legally obtained and its harvest was not detrimental to the maintenance of “that species throughout its range at a level consistent with its role in the ecosystems in which it occurs”.