THE TIMBER TRADE AND GLOBAL FOREST LOSS

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ABSTRACT

Research carried out for WWF suggests that the international timber trade is now the primary cause of forest degradation and loss in those forests that contain the highest levels of biodiversity. This contradicts the popular assumption that deforestation and forest degradation are caused mainly by shifting cultivators and fuelwood collection. The conclusion has been reached by extending the analysis of causes of forest loss in a number of ways: assessing *all* forests, rather than just rainforests or tropical forests; considering forest *quality* as well as *quantity*; estimating the impacts of illegal logging; correlating logging sites with species-rich forests; and including the impact of logging on other forest uses.

These findings have important implications for international initiatives aimed at developing systems of sustainable forest management, and for non-governmental attempts to address forest problems, such as independent timber certification.

Introduction

Following centuries of degradation, many natural forest ecosystems are now severely threatened. Natural forests in many temperate and boreal countries have already been reduced to a few fragments and losses continue in the tropics. According to the latest global survey by the UN Food and Agriculture Organisation (FAO), deforestation is currently taking place in at least 76 countries, and in the majority of these the rate of loss is accelerating[1]. The planet currently contains large areas of recently cleared forest, young regenerating forest and middle-age forest. Far less common, particularly in the temperate regions but increasingly also in the tropics, are old-growth forests. These generally have a specialised flora and fauna, a proportion of which can only survive in forests that have been relatively undisturbed for long periods of time. Surviving areas of natural or semi-natural forest habitat are therefore of primary importance in maintaining biodiversity.

Addressing problems of forest loss will only be possible if we have a thorough and accurate understanding of the causes of loss. Over the past two decades, the primary causes have usually been identified as impacts from peasant farmers, including intensification of shifting agriculture, overgrazing by domestic livestock and fuelwood collection. Population growth has often been named as an underlying cause. Whilst these certainly all do play an important role in forest loss in some places, recent research by WWF suggests that, at least in those forests which are most important from the perspective of biodiversity, most contemporary assessments exaggerate the significance of clearance by peasant farmers and fuelwood collection, and understate the importance of industrial impacts, including particularly commercial timber extraction, for both national use and the international trade.

There are a number of reasons for this discrepancy. Most assessments concentrate almost exclusively on deforestation in tropical forests, thus missing the potential impacts on other forests, including those in temperate and boreal regions. They also fail to account adequately for the impacts of forest degradation in areas that are not entirely cleared of trees. Many studies based on official statistics also omit the impacts of unofficial changes, such as illegal mining and logging, which often do not appear in government figures, but have consequences that can sometimes exceed "official" changes. Furthermore, the links between different causes are often missed or undervalued, so that secondary causes are stressed rather than underlying causes. Lastly, and perhaps most important of all, is the fact that not all forests are of equal value for wildlife, and general surveys of forest loss do not generally attempt to match changes with centres of high biodiversity.

The WWF study attempted to carry out a broader assessment of impacts on forests, by widening the analysis in a number of ways:

- considering forest quality as well as quantity;
- assessing all forests, rather than just rainforests or tropical forests;
- estimating the impacts of illegal logging;

- including the impact of logging on other forest uses;
- correlating logging sites with species-rich forests.

The preliminary conclusion of the WWF study was that commercial timber extraction was now the single greatest threat to those forests which are richest in biodiversity. This judgement is examined and explained in more detail in the following article, and its policy implications for government and industry are discussed.

Quality and quantity

Most analyses of changes to forests concentrate on deforestation. Whilst this is clearly of great importance, particularly in developing countries, it misses the parallel impact of forest degradation; ie a decline in the quality of the remaining forest. Anthropogenic causes of a decline in forest quality include the impacts of air pollution, introduced pests and diseases, stress caused by management, and the replacement of natural or old-growth forest with intensively managed forests or plantations. Air pollution has already caused substantial losses in epiphytic flora in many European forests[2,3], which in turn has had impacts further up the food chain. Further changes are likely in the future as critical loads of pollutants are exceeded in many conservation areas[4]. Introduced pests also threaten biodiversity, for example in India, a major pest in exotic pines, Cercospora needle blight, is now threatening the survival of the native Pinus roxburghii and P. wallichiana[5].

Replacement of natural forests with plantations also generally results in a steep decline in biodiversity[6]. From the perspective of conservation biology, in an extreme case there can be little to choose between replacing a natural forest with a tree plantation and losing it altogether. In either case, the majority of the original native wild plant and animal species disappear.

Even logging and regeneration can have important consequences for biodiversity in some habitats. Many studies in both tropical and temperate countries have found a decrease in natural species following disturbance, for example in Indonesia[7] and Canada[8]. Species reliant on old-growth forests, such as the spotted owl (Strix occidentalis), marbled murrelet (Brachyramphus marmoratum) and pileated woodpecker (Dryocopus pileatus) in the Pacific Northwest of the USA, are sometimes directly threatened as a result of logging[9].

Some impacts are extremely long lasting and for example comparison of woodland flora in the UK found considerable impoverishment even in woods that had been established for 400 years[10], when their floras were compared with more ancient forests. Even if total number of species remains constant, the rarer natural species are often replaced by aliens and weed species.

Analysis of impacts should therefore consider more than just the loss of area under trees and include the biological quality of the forest that remains. Major conversions from natural forest to plantation have already occurred in parts of Europe and North America, where only a few percent of old-growth forests remain, and are currently taking place in various developing

countries including Malaysia, Indonesia and Brazil. Intensification of management is taking place in many other areas, often with little understanding of the ecological implications. If overall forest quality is considered, the importance of commercial timber activities immediately increases in significance.

Including all forests in assessments

Previous emphasis on problems in tropical rainforests has tended to obscure issues in other forests. Some of the most rapid rates of loss of old-growth forests are currently taking place in temperate and boreal regions. The WWF study looked at all forests, and in consequence the role of the timber trade immediately became more apparent. Unlike tropical moist forest, where causes and effects of forest loss are complex, in almost all temperate and boreal countries still possessing substantial old-growth forests, timber extraction is now undoubtedly the primary cause of natural forest loss[11]. For example, commercial timber activities are now the most important cause of loss in old-growth forests in the Pacific Northwest of the USA[12], western Canada[13], the Russian Federation[14], and probably also in the remaining old-growth fragments of Fennoscandia. Impacts include both logging and intensification of management.

Illegal logging operations

Assessments of the environmental impacts of the timber industry tend to draw on official studies of the *legal* timber trade. In some countries undergoing severe deforestation, the timber recorded by the Ministry of Forests is only a small proportion of the actual fellings and/or exports. Much illegal timber enters the international trade, with or without the knowledge of importers. Often, illegality is tacitly accepted by the buyer.

Countries where illegal logging is having an important, and largely unquantified, impact on natural forests include (not an exhaustive list): Kenya[15], Thailand, Cambodia, Laos, Vietnam, Indonesia[16], Brazil, Bolivia, Ecuador, Georgia and the Russian Federation. Until recently, 80 per cent of the mahogany leaving Brazil was exported illegally[17]. In 1990, the illegal timber trade from the Philippines, which had banned timber exports because of severe deforestation, was estimated by the Economist Intelligence Unit as being worth US$800 million a year[18]. Illegal loggers often target particularly valuable species, have little concerns for principles of sustainable logging and operate in remote areas, including many national parks and other protected areas..

Impacts of the timber trade on other sectors

In developing countries, the impact of the timber trade has frequently been underestimated because its role in exacerbating other causes of deforestation has been undervalued or ignored. Loggers are often the first outsiders to penetrate tropical moist forests, leading to further degradation, when farmers use logging roads to enter previously closed forest, and further degrade selectively cut areas to establish temporary or permanent farms. By removing a proportion of the forest, timber operations also concentrate human pressure onto successively smaller fragments, so that what might once have been a sustainable harvest of fuelwood and fodder becomes a net cause of degradation.

Forests rich in biodiversity

Time has also increased the relative impact of the timber trade. Primary forest has now been reduced to fragments in many countries. As the amount of high quality, natural forest declines, and is increasingly confined to areas which are inhospitable to human settlement, the proportion of this remnant that is damaged by the timber trade continues to grow.

Recent research by WWF, in cooperation with IUCN and the Smithsonian Institute, analysed the causes of degradation in 233 of the world's most important sites for plant conservation. Over 85 per cent of these were found to be currently vulnerable or under threat, and a fifth are already severely threatened. The research covered all types of habitat, and not just forests. Yet logging was identified as a key threat in over half the sites investigated, suggesting that it is proportionately even more important in forests[19].

As part of the current research, the authors collected information on areas in which logging is currently a major, or the major, cause of loss in biologically important forests. The results are summarised in Table 1.

There is no accident in the overlap between biologically-rich forests and forests with large timber operations. Areas of high biodiversity tend to contain the oldest, and thus in many cases the most commercially valuable, trees. Natural forests are often virtually unclaimed, under the stewardship of politically weak indigenous groups, or nominally under state control. Forests with high biodiversity are, by their very nature, likely to draw the attention of the global timber trade.

The actions of the national and international timber trade are thus now critical to the survival of most of the world's biologically richest forest ecosystems and therefore to the majority of species.

The way forward

These preliminary results require further amplification, particularly in quantifying impacts of various causes of degradation in biodiversity hotspots. The next UNECE/FAO Forest Resource Assessment, to be completed by the year 2000, plans to include details of forest quality alongside forest area, and this information should provide further clarification of where losses are occurring. The Convention on Biological Diversity might be a useful forum to coordinate a wider analysis of logging impacts on biodiversity.

The next two or three decades will decide whether or not we enter the future with a full range of rich and diverse forest ecosystems. The future actions of the timber trade will play a vital role in this, often implicit, decision. Although the situation is serious, there are some optimistic signs. A substantial, and growing, section of the timber trade is prepared to take environmental issues seriously, and is making real efforts to change its practices. Developments such as the establishment of the Forest Stewardship Council, and efforts to promote certification in countries such as Belgium, Sweden, Finland and the UK, provide a framework for changes in forest management that will have important benefits to wildlife[20].

On the other hand, some sections of the trade are responding to the perceived "threat" of environmentalism by resisting change and fighting back; pressuring governments and aid agencies, funding front groups to discredit the environmental lobby, accelerating felling rates to beat planned controls, moving into areas where environmental controls are lax, and delaying reforms. The question of which approach is taken by the majority of the trade is still open to question. However, we believe that this research shows that it is no longer possible for the commercial timber trade to argue that it is only a minor cause of forest degradation and loss.

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Country	Status and details
Europe	
Finland	Only 1-2% old-growth forest remains; this is still being logged in places.
Latvia	Logging has increased 700% in the last few years, mainly for the export market, threatening important swamp forests.
Norway	Logging of remaining old-growth forest has increased since plans for additional conservation legislation were suggested.
Poland	Logging has intensified since 1989, and is taking place on the edge of the internationally important Bia_owieza forest Biosphere reserve.
Sweden	Logging of old growth forest continues in the boreal region, despite being reduced to 1-2% of the original.
UK	Illegal felling of broadleaved trees to sell as firewood is on the increase.
Russian Federation	Logging is occurring in many biologically rich areas of Siberia and European Karelia. In the latter case there is currently a growing cross-border trade in birch with Scandinavia
North America	
Canada	Boreal forest logging is taking place on a large scale in many areas, including particularly Alberta. In Ontario, two thirds of the remaining 1% of old-growth forest is slated for commercial felling.
USA	Logging of old-growth forests in the Pacific Northwest looks likely to increase again in response to government aims to deregulate the industry and overturn environmental legislation.
South America	
Argentina	Temperate forests are rapidly being logged by foreign companies, including many from North America.
Bolivia	Forest loss has now reached critical levels in some areas as a result of illegal logging.
Brazil	Illegal logging of mahogany is having a major impact on the ecology, and the survival, of forests in many areas, and until recently 80% of mahogany exports were of illegal felled trees.
Chile	Large areas of beech (*Nothofagus*) have been logged to make way for pine plantations in the last decade, often by foreign companies, and *Araucaria* forest is also threatened.
Guyana	Increased logging by foreign companies is now threatening one of the largest remaining areas of pristine rainforest in the region.
Suriname	Malaysian, Indonesian and Chinese companies are preparing to log in pristine rainforest.
Africa	
Cameroon	Numerous transnational companies are operating in the country, including companies from Belgium France, Germany, and Italy. A survey in 1993 identified 100 forest operations, 60 of which were foreign-owned. Logging has increased 100% in the last few years.

Central African Rep	90% of the forests have been allocated to 10 companies, including 4 from France, 2 from Romania and 1 from former Yugoslavia.
Congo	At least 15 of 36 active timber companies are foreign-owned, controlling about half the cut and based in Germany, the Netherlands and France.
Côte d'Ivoire	Less than 14% of the original forest remains. Companies from Denmark, France, Germany, Italy and Holland remain active.
Gabon	Most timber production is under European control, predominantly from France but also from Germany, Italy and Switzerland. Latest estimates for deforestation are 0.6%/year.
Ghana	More than 90% of forests have been logged since the 1940s. Danish and Dutch companies operate, and in the late 1980s a state-owned timber company was rehabilitated by a UK company; this was abandoned after allegations of corruption.
Nigeria	Much of Nigeria's small area of remaining forest is threatened by legal and illegal timber operations.
Zaire	Around ten timber companies are operating in Zaire, and most logging is carried out by foreign-based firms from Belgium, Canada, Denmark, France, Germany and Italy. Logging is increasing rapidly.
Asia	
Cambodia	Illegal timber felling has increased enormously over the past few years and is rapidly depleting the country's forests.
Indonesia	The government intends to replace 2 million hectares of forest with plantations by 2000. Commercial forestry is a major cause of forest loss in Kalimantan, Irian Jaya and outer islands such as Siberut.
Laos	Illegal logging has increased rapidly as a result of a ready market created in Thailand due to the latter's logging ban.
Malaysia	Logging is the major cause of forest loss in Sabah and Sarawak, and is still important in some areas of Peninsula Malaysia.
Philippines	Logging has already caused major deforestation in the country. Illegal logging is now more important than legal operations and is still a major source of exports.
Thailand	Illegal logging continues despite a logging ban, particularly in the north east and on the Burmese border.
Vietnam	Large areas of the country are being cleared of natural bamboo to feed pulp mills.
Pacific	
Australia	Logging is the major cause of forest degradation and loss, particularly in the south west and Tasmania
Papua New Guinea	Logging, including illegal logging, is the major cause of forest loss in PNG, mainly involving expatriate firms from south east Asia.
Solomon Islands	Legal and illegal logging is the major cause of forest loss.
Vanuatu	Logging is increasing rapidly, mainly controlled by expatriate Malaysian companies.

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