Reduced Impact Logging:
A Lighter Approach to Harvesting in the World's Tropical Forests

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Introduction

To many people, the terms "deforestation" and "logging" are one in the same. According to conventional wisdom, logging in tropical forests is tantamount to total and irreversible devastation.

Logging activity does result in significant tropical deforestation and because of this a number of initiatives are underway to reduce the environmental impact of periodic timber harvesting. New standards of practice, as described by the term **R**educed **I**mpact **L**ogging (RIL), result in minimal forest disturbance in both the short and long term and serve as a basis for sustainable management of tropical forests. Because application of RIL allows generation of significant income from forests while leaving forests largely intact, RIL (both alone and as part of more comprehensive forest certification programs) effectively provides an alternative to conversion of forests to agriculture.

Sometimes clearing of forest land to create agricultural fields is confused as logging. Throughout history including today, the conversion of forestland to agriculture is the dominant driver behind deforestation. In fact, estimates generally attribute 65 to 80+ percent of forest loss in tropical areas to agricultural conversion. So, while removal of trees is an initial step in the conversion process it is useful to recognize this activity as "clearing", a farming activity, rather than "logging," a forestry practice. Logging accounts for some 6 to 15 percent of tropical forest loss.

Common Practice and RIL

Logging practices differ in various tropical regions, and those factors that distinguish typical logging from reduced impact logging differ from region to region as well. The Brazilian Amazon is used as a basis of comparison in this discussion.

In the tropical regions of Brazil, logging never takes the form of extensive clear-cutting. Large land areas devoid of trees result from land clearing for conversion to crop or pasture land, but the existence of local, regional, and international markets for only a small number of the hundreds of species that grow to tree size preclude clear-cutting in forestry operations (Figure 1).

While the vast majority of timber harvesting operations in Brazil do not result in anything close to total removal of forests, traditional logging can, nonetheless, significantly and visibly impact forests. Often, minimally trained individuals are hired to fell commercially valuable tree species, to cut logs into lengths that can be conveniently moved, and to then move (or skid) the logs to a roadside clearing (or landing) for loading onto trucks. Minimal training translates to somewhat haphazard felling. Inaccurate felling, in turn, results in more skid trails than necessary and inordinate damage to the forest floor and to remaining trees. In addition, inaccuracy in felling often leads to an

inability to locate felled trees once the first log has been skidded to a landing, meaning that the second and third logs wind up being left in the forest.[1]

Another downside to traditional logging is that vines that often connect one tree to the next are seldom cut prior to felling. This can mean that the felling of one large tree brings down or breaks the crowns out of up to six or ten other trees (Figure 2).

Figure 1
A large clearing in the tropical forest, such as this one about 200 km south of Belem, Brazil, is virtually always the result of clearing for agriculture – in this case for cattle ranching.

Photo by Jim Bowyer

Figure 2
When vines that connect trees are not cut prior to harvest considerable damage may occur to remaining trees

Photo by Jim Bowyer

[1] The inability to locate felled stems after harvest is accentuated by the fact that trees to be felled are not mapped prior to harvest, nor are the locations of skid trails, access roads, and log landings carefully planned.

Yet another characteristic of traditional logging in the Brazilian Amazon is that the large skidding machines used to move logs from stump to landing are rarely equipped with grapples or winches that are capable of lifting the leading ends of logs clear of the ground. Without the ability to lift the ends of logs off the ground, the heavy logs plow through the forest floor as they are being moved, exposing considerable mineral soil (Figure 3a,b). This, in turn, increases soil compaction as well as wear and tear on the expensive skidding machinery.

Figure 3a, 3b
Skidding of logs in traditional logging often exposes considerable mineral soil

Photos by Johan Zweede, Tropical Forest Foundation, Belem, Brazil

Enter **R**educed **I**mpact **L**ogging (RIL), a set of practices designed to eliminate or minimize harmful site disturbance and other environmental problems associated with traditional logging.

How Reduced Impact Logging Differs From Traditional Logging

RIL involves:

Development and use of accurate contour maps of all areas in the forest management area.
Development and implementation of a long-term forest management plan.
Extensive training of harvest crews in directional felling.
Cutting of vines at least one year prior to harvest (not needed in some areas where vines are less prevalent)
Mapping of specific trees to be removed in immediate and in the next harvest cycle.
Planning of access roads, skid trails, and log landings only after the mapping of harvest trees so as to minimize the area impacted and to provide protection to non-harvest trees.
Extensive training and follow-through on road building to create permanent, well-conceived access roads.
The use of skidders equipped with heavy duty log-lifting winches or grapples.

The net effect of the implementation of RIL is dramatic. The impact of road networks and skid trails is significantly less than when traditional logging is practiced (Figures 4a, b, Figure 5), and the landscape overall is left in a condition that is very much similar to pre-harvest conditions. Recovery of harvest sites, moreover, is typically very rapid.

Figures 4a, 4b
Access Roads Built to RIL Standards in the Brazilian Amazon

Photos by Johan Zweede, Tropical Forest Foundation, Belem, Brazil

Figure 5
An Amazon Skid Trail Along Which Logs Were Moved
to the Log Landing by a Grapple Equipped
Skidder Only Hours Previously.

Photo by Jim Bowyer

Differences between reduced impact and traditional logging are easily seen in aerial photos of two side-by-side Amazon harvest sites, one harvested using traditional practices, the other employing RIL (Figures 6a, b). The same volume of timber per hectare was removed from both harvest sites, and both photos are of the areas upon completion of logging.

The negative impacts of traditional logging techniques are clearly visible immediately following the completion of harvest (Figure 6a), whereas the unit harvested by RIL techniques shows considerably less impact. A log landing is clearly visible in the lower left center of Figure 6b, and a close inspection will reveal an access road cutting across the center of the photo from the lower right toward the upper left corner.

Figure 6a
A Post-Harvest Aerial View of a Forest Unit Harvested Using Traditional Practices – Cauaxi, Brazil

Figure 6b
A Post-Harvest Aerial View of a Forest Unit Harvested Using RIL – Cauaxi, Brazil

Photos courtesy of Tropical Forest Foundation

Impacts in the Forest

The ultimate question is whether low impact logging translates to sustainable forest management over the long term. Based on intensive work over the past several decades, the answer appears to be that RIL is a key element of sustainable forestry. It also appears that it is possible to manage tropical forests over the long term using a management system that includes periodic harvesting.

RIL relates to the Forest Stewardship Council (FSC) and other forest certification programs in that this is a critical piece of sustainable forestry at the on-the-ground level. Many companies operating in tropical regions that seek forest certification endorsement first undergo training and implementation of RIL, viewing this as an essential first step in the process. In some cases, RIL is the only near-term solution to improving forest management practices; in some countries, for instance, the lack of government attention to First Nation issues precludes certification by the FSC. However, given the complex nature of dealing with such issues, progress on improvement of forest management practices can effectively be held hostage for a very long time. In this case, adoption of RIL can produce immediate improvement of practices, while maintaining forests for whoever winds up to be the ultimate landowner.

Costs of RIL

Early in the development of RIL, skeptical industry observers viewed it as a system that was bound to be considerably more costly than traditional logging. In fact, within industry circles in many parts of the tropics, RIL was quickly dubbed "Reduced Income Logging." Fortunately, the moniker is not supported by the facts.

An extensive study of the Tropical Forest Foundation (TFF) Cauaxi site showed costs of logging using RIL to actually be slightly less than those associated with traditional logging. Although the costs of producing contour maps, establishing the location of each harvest tree, planning of roads, and equipping skidders with heavy duty winches and grapples is significantly higher than in traditional logging, these higher costs are more than erased by the reduction in equipment wear and by the fact that almost no commercially valuable logs are left in the forest when practicing RIL. The Cauaxi study found that almost 18 percent of harvested volume remained in the forest following traditional logging, meaning that 18 percent greater volume had to be felled in order to realize the same volume than if all logs were recovered.

In some parts of the world it appears that practicing RIL does, in fact, cost more than logging as traditionally practiced, but differences again appear to be small – on the order of 3 to 5 percent. Whether firms willing to pursue a more responsible course of action will be able to convert actions to advantage in the global marketplace remains to be seen. If so, then a profit motive might provide added incentive to those now watching from the sidelines.

Why Harvest at All?

Some question why it is necessary to even consider harvesting within tropical forests. Isn't leaving the forests completely alone far more sustainable than building access roads and cutting trees, no matter what is done to reduce the impact?

In a perfect world the answer to the question posed above is probably yes. However, it turns out that the regions of the world in which populations are growing most rapidly today are the tropical regions. There is great pressure to produce more food, more fuel, more building materials, and more sources of income in these regions. The inconvenient reality is that if the inhabitants of these regions are unable to find sufficient tangible value in forests, then the likelihood of conversion of forests to agriculture or some other land use rises sharply. Finding ways to sustainably manage forests for a range of values including wood and non-timber forest products can provide an essential incentive for retaining forestland as forest for the long-term.

The Bottom Line

It is not at all true that harvesting in tropical forests is necessarily synonymous with forest destruction. It is possible to manage tropical forests for the long-term using management systems that include periodic timber harvesting. By practicing the elements of Reduced Impact Logging, the basis for sustainable forest management is put into place and immediate benefits are realized through significant reductions of the on-the-ground impacts of forest harvesting.

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