Is 'Good Wood' Bad for Forests?

Two researchers are challenging the gospel that sustainable management is the way to save tropical rain forests. But critics counter that their viewpoint is naïve and damaging

Conservation biologists have long believed that the way to save tropical rain forests and the wondrous wealth of species inhabiting them is to harvest their trees in a "sustainable," ecologically sound manner. Give the local people—whether loggers, indigenous people, or peasant farmers—a direct economic stake in a forest and its long-term health, and they will act as caretakers, cutting no more trees than the forest can regenerate. As long as the trees last, biodiversity will be preserved. Or so the theory goes.

But that notion has come under question recently from two researchers, resource economist Dick Rice of the Washington, D.C.–based environmental group Conservation International and Ted Gullison, a tropical forest ecologist at London's Imperial College, who have been studying a mahogany-logging operation in a remote corner of the Bolivian Amazon. They contend that, in some cases, sustainable management can be bad for forests, biodiversity, and even loggers' balance sheets. Their heretical prescription for saving at least some rain forests is to permit loggers to liquidate the most valuable tree species and then place the forest off limits to commercial logging.

Not surprisingly, their ideas—presented in February in Seattle at the annual meeting of the American Association for the Advancement of Science (AAAS, which publishes *Science*), among other forums—are raising hackles. Over the past decade, hundreds of millions of dollars have been spent to promote sustainable forestry by a veritable empire of advocacy groups, nongovernmental organizations, development agencies, government councils, and think tanks. In addition, this month marks the launch of the Forest Products Buyers Group, a consortium of North American companies, organizations, and universities that intend to use their collective buying power to encourage timber suppliers in the United States and abroad to provide products made of "good wood," as sustainably harvested timber is known. According to critics, Rice and Gullison are spreading a damaging message at a crucial time for tropical forest conservation.

Still, many biologists and even some environmentalists say Rice and Gullison are just going public with concerns that ecologists have discussed among themselves for years, and the pair have stimulated a long-overdue debate about the ecological merits of sustainable forestry. Nigel Sizer of the environmental policy group World Resources Institute in Washington, D.C., says that when he invited Rice and Gullison to present their findings at the AAAS session, some of his colleagues in the conservation community objected. "But opening the discussion is a healthy thing to do," he asserts. "The science of sustainable forestry needs to be rigorous and transparent. Gullison presented a very powerful argument that we know almost nothing about how to manage forests sustainably."

CONSERVATION INTERNATIONAL

Radical solution. Allow loggers to cut prime trees and then close the forest to timber harvesting.

High hopes

For the two researchers, it has been a long and at times troubling road since 1990, when they met by chance at the cantina of the Hotel El Dorado in La Paz, Bolivia. Rice had just visited a half-million-hectare tract of Bolivian rain forest—called the Chimanes Permanent Timber Production Forest—which the International Tropical Timber Organization (ITTO), a trading group founded to help protect tropical forests, had targeted to become a model for sustainable timber management. Gullison, then a Ph.D. student at Princeton University in New Jersey, was in Bolivia studying the ecology of broadleaf mahogany. Over beers, the pair discovered their common interests and decided to collaborate on a study of the complex relationships between harvesting intensity, logging economics, and biodiversity preservation in the Chimanes forest.

There are almost as many definitions of sustainability as there are trees in a pristine forest. But from a silvicultural standpoint, sustained-yield logging generally involves intensive harvesting of multiple species coupled with efforts to promote the growth of new, desirable trees, such as planting seedlings and thinning competing vegetation. Just such a plan had been drawn up for the Chimanes forest, and millions of dollars were being spent to implement it, Gullison says, but to little effect. On the ground, timber quotas were going largely ignored, and the forest was being mined for its mahogany. Enforcement officials had only one jeep for patrolling an area the size of Delaware, he says.

Rice and Gullison hoped that their study's findings might be useful in helping to turn around the situation. But partway through their 4-year project, they began to suspect that in the Chimanes forest, at least, managing for a sustainable supply of hardwoods could do more harm than good. Not only would such a plan be political and economic pie-in-the-sky; it would require so much tree-thinning to ensure the regrowth of mahoganies and other commercial trees that it would put a host of other species at risk. "In winning the battle for the mahoganies," Rice says, "we might lose the war for biodiversity."

As Rice's analyses revealed, the sustainable practices proposed for Chimanes were not in the loggers' best interests. Chimanes is so remote that it makes sense for loggers to cut—and transport—only the most valuable trees, in this case, mahoganies. Further, given the high interest rates in Latin American countries, it is far more attractive for loggers to mow down prime mahoganies quickly and bank the profits than it is to leave some trees standing for future harvests.

"From a purely financial perspective, they're taking the most rational approach," explains Rice. In Bolivia, invested money grows at about 17% annually. Slow-growing mahogany in the wild only appreciates at about 5% a year, about 1% of that from price increases in the timber and 4% in the size of the standing trees. Given those numbers, the loggers' clear choice is to do just what they are doing—especially when, by delaying harvests, they run the risk of losing trees to wind, fire, or pests. "The loggers face the same choice you do when you have to decide between a retirement fund that yields 17% and one that yields 6%," he says.

Rice has come to believe that if conservationists really want to protect rain forests, they should stop trying to force Third-World log-

gers to harvest highly valuable trees at a leisurely pace, and stop investing in costly measures such as reforestation and thinning. Instead, why not take advantage of the status quo, he asks. Once the mahoganies are gone, the forest will have negligible value to loggers, at least until export markets open up for alternative hardwood species. In the interim, conservationists could step in and buy the devalued forest and convert it to a national park. In that window of opportunity, "the cost of conservation would be low," he asserts.

Critics counter that the situation in Chimanes is too atypical to be applied to efforts to protect other rain forests. In most parts of Asia and Africa, timber operators harvest not just one tree species but half a dozen or more, argues Richard Donovan, director of the Smartwood program, which certifies green logging operations. To allow loggers free rein, he says, would be a prescription for disaster. He also asserts that it's "naïve and unrealistic" for Rice to think that funds will be available to lock up big chunks of tropical forests, devalued or not.

Not so green

But as Gullison points out, sustainable management can have ecological drawbacks, too. For starters, while on paper regrowing trees sounds environmentally benign, on the ground it often entails extensive physical damage to a forest. Like many other hardwood species, mahogany seedlings don't compete well in the dim light of an intact forest. When left to their own devices, in fact, they only grow where natural disturbances, such as hurricanes, fires, and floods, have ripped open big holes in the canopy. So, to regrow trees, forest managers undertake massive interventions: One method is to clear-cut swaths 30 to 40 meters wide through a forest and plant saplings in the clearings. This typically is followed by periodic thinnings to reduce competition from "trash" trees and underbrush.

Sustainable operations also can physically damage a forest by requiring loggers to go after a variety of less valuable, secondary species. In the Chimanes, loggers' current tactics of high-grading mahogany have relatively little physical impact, says Gullison. The prime mahoganies are widely dispersed—only one or two trees growing in a typical 10-hectare area—so less than 5% of the forest is being disrupted by roads and skidder trails. He estimates that if the sustainable management plan were being strictly enforced, the damage would more than double. "Unsustainable logging does not necessarily imply Vancouver Island–like clear-cuts," says Rice. Unsustainable logging for a few select species can be more benign than keeping the loggers in the forest forever, he adds. "There are logged areas of Bolivia that, from the air, look pristine."

There haven't been many studies documenting the impact of alternative harvesting practices on biodiversity. Work in Uganda's Kibale Forest during the mid-1980s by Andrew Johns of Cambridge University in the United Kingdom and Joseph Skorupa, then a graduate student at the University of California, Davis, suggests that primates may do all right in moderately disturbed rain forests. Colobus monkeys, for example, were found to thrive in selectively logged areas, because the fruiting trees they prefer tend to colonize regenerating habitats. But a study conducted by University of Wisconsin zoologist Douglas Mason suggests that even sustainable practices can devastate bird populations. He found that Venezuelan antbirds suffered steep declines in logged-over forest reserves that had been replanted with saplings in strip clearings.

"Let's not pretend that sustained-yield forestry and biodiversity preservation are in any way compatible," says Peter Ashton, a dendrologist at Harvard University. He says he can't think of one tropical logging operation that could be certified for both timber production and overall biodiversity maintenance, particularly on the level of microbes, fungi, epiphytes, and insects.

Stakeholders. Sustainable forestry may not be the best way to preserve all forest species.

Like Donovan, Ashton questions whether Rice and Gullison's Chimanes paradigm can be widely applied. A single-species harvest is "increasingly rare as populations expand and demands on forests increase," he says. He also wonders what happens a decade or so down the road when a "clamoring population" living on the edges of a locked-up forest starts "raising an outcry that conservation organizations bought the forest for less than fair value."

Against the grain

In challenging the gospel about sustainable forestry, Gullison and Rice knew they would chafe many of their colleagues. In fact, Rice says he initially went through a period of denial. "It took me a long time to accept the reality of what was staring me in the face. ... None of the arguments [for sustained-yield management] were making sense, but I was hesitant to contradict the conventional wisdom." Conservation International has continued to support their work, but the project's Bolivian sponsor, BOLFOR, washed its hands of the study after calling their results "biased," says Rice.

At the Seattle meeting, Gullison said his point was not to knock sustainable management but to emphasize how little is known about the effects of manipulating tropical forests. "Ecologists have been reactive," he says. "They document effects of what is taking place now. We need to be much more experimental to understand the impacts and to design management systems that better meet biodiversity conservation objectives." His thesis adviser, Stephen Hubbell, a veteran of 30 years studying forest ecology, makes the case more emphatically. "Our level of knowledge about tropical forestry is truly bad," he observes. "I can imagine [harvesting regimes] with relatively little impact on biodiversity, but I don't see any developing country where this is the case. There's lip service being paid to it."

Funding for broad, interdisciplinary science and policy studies has been painfully slow in coming, says Ashton. For instance, the Smithsonian Center for Tropical Forest Science, proposed in 1991 to use research on forest dynamics and economics as leverage to achieve policy reform, for instance, remains just a rosy idea. "We can't get the money for it," he says.

Whether the expedient model Gullison and Rice have proposed could be applied to other beleaguered rain forests remains to be seen. "I have problems with their thesis, but some of their data are useful," comments David Cassells, a World Bank specialist for forest resources. "The bottom line is that they've focused on the need for protected areas as a conservation strategy."

Cassells, who spoke on the same panel in Seattle as Rice and Gullison, is fond of citing World Resources Institute Vice President Walter Reid for the last word on sustainability: "What the world needs now is sustainable-enough forestry, which means choosing what's to be sustained and for whom, and moving in that direction sooner rather than later."

–Michael McRae

Michael McRae is a writer in Ashland, Oregon.

CLOCKWISE FROM TOP LEFT: K. ZICAFOOSE/K. ZICAFOOSE/T. PARKER/K. ZICAFOOSE/T. PARKER BACKGROUND: R. FOSTER