

The rainforest issue: Myths and facts

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From movies to classrooms to the nightly news, Americans are constantly being told that of the world's environmental "crises," the staggering loss of tropical rainforest, and Amazon rainforest in particular, is right up there at the top. Pictures of charred remains of once lush jungles flicker before our eyes, we are shown the exotic plants and wild species that are being made homeless by the chainsaw and the flame, and numbers likened to one football field per second are used to describe this devastating loss. As a result of this, we are told that the tropical rainforests will all soon disappear, that nearly half of all the species on planet earth will soon be extinguished, and that these areas must be basically put off limits to humankind if we have any hope of saving this wonderful miracle of nature. With an emphasis on the Amazon region, the following paper provides some background on tropical rainforests, examines the truth about deforestation rates and the species extinctions that are said to follow, and compares two very differing views about the relationship between people and nature in the tropics.

BACKGROUND

The word "rainforest" was coined in 1898 by a German botanist to describe forests that grow in constantly wet conditions, with an average annual rainfall of 80 inches per year or more. There are differing kinds of rainforest including "flooded mangrove forests along the salty coastline of SE Asian islands, high-altitude cloud forests of S. American, temperate rain forests of the U.S. Pacific Northwest," and the "tropical rain forests that form large pockets of green along the earth's equator" — the major focus of this paper. Tropical "rainforests grow in more than 50 countries but about half of the total is in just three: Brazil with 33%, and Zaire and Indonesia with 10% each," and 57% of total is in Latin America. (National Wildlife Federation – Educator's Guide)

Tropical rainforests are found within the tropics of Cancer and Capricorn, in a belt that girdles the earth. Location is between 23 1/2 degrees north and 23 1/2 south of the equator. They grow through the heart of South America, Africa, Northern Australia, Malaysia, Indonesia, and the Philippines, to name a few. (Lessons of the Rainforest, Donald Perry, p.26)

Tropical forests today cover about 13% of earth's surface (others say only 7%). Amazon covers 6.5 million square kilometers, of which 3.5 million is in Brazil. "Brazil has created what is known as Legal Amazonia which covers nearly 5 million square kilometers, or 57 percent of Brazil's territory. The entire continent of Europe could fit inside Legal Amazonia, and 70 percent of it is tropical forest." (The Cross and the Rainforest, p.146)

Within the Americas, tropical rainforests are located in five main regions: Mexico and Central America (known as Mesoamerica), Pacific Coastal Columbia and Ecuador (known as the Choco which extends from the Panama border south to northern Ecuador, is the wettest region in the world, and in terms of biological diversity is thought to be one of the most important in the world), the Caribbean Islands, the Guianas and Amazonia (which contain the largest contiguous rainforest in the world including part of eight countries — Bolivia, Brazil, Columbia, French Guiana, Guyana, Peru, Suriname and Venezuela – app. 7 million square kilometers), and finally, Atlantic Coastal Brazil. (Lessons from the Rainforest, Ghillean Prance, pp. 53-54).

Early explorers to Brazil and Zaire were probably the first to use the word “jungle” because as they traveled through on boats, riverbanks were tangled with vegetation and they thought the interior was probably that way too. But the edges have thicker plant growth because of extra light. Interior is made of trees, shrubs, vines, ferns and other plants “growing to form a complex system of layers.” (NWF – Educator’s Guide)

Characteristics

There are three main characteristics of the tropical rainforests. First, is lush vegetation with dense, closed forests and high canopies that allow little light to reach the ground. Second is rich flora and several endemic species. Third is stratification. (“Environmental Gore,” Evaristo de Miranda, p.154)

On top is the emergent layer of giant trees, growing to heights of 115 to 250 feet. Only one or two emergents per acre usually, and have small leaves, umbrella shaped crowns and tall, slender trunks.

Next is canopy layer at 65 to 100 feet formed by flat-crowned trees that offer near-continuous cover over the forest. Catch most of the sun’s rays, allowing only 2 to 5 percent to slip through to forest floor.

Below this is understory of trees that usually don’t grow higher than 15 feet or so along with young canopy trees and shrubs. Many have large leaves that may help absorb light in dim understory.

On forest floor, air is very still, humidity is almost always above 70%, and temperature is relatively constant and other than seedlings, herbs, and ferns, vegetation is sparse due to lack of light. Also, mostly free from decaying logs and dead leaves since high temps and humidity are good place for billions of microorganisms in soil to break down debris quickly. “This fast and continual recycling of nutrients is what keeps rainforest systems working so efficiently, despite their shallow, relatively infertile soil.” (NWF-Educator’s Guide)

According to one study, 75% of the nutrients found in rain forests is located in the plants, 17% is in decomposing matter, and only 8% is in the soil itself. Therefore,

they have developed as closed systems where “anatomical, physiological, biochemical, and ecological mechanisms...guarantee little loss, little uptake from the sources, and thus, conservation of nutrients.” (deMiranda – p.155)

The benefits of the rainforest First and foremost, tropical rainforests “are home to a vast biological array of living organisms...and support more plant and animal species per unit area, as well as overall, than any other ecosystem on earth.” Current estimates of the total number of living species on the planet range from five to 30 million or more, of which only 1.4 million have been described by scientists. More than two-thirds of these species come from tropical rain forests, basically because the forest are home to the most species-rich groups in the world — anthropods and flowering plants.

Peru, for instance, is home to around 30,000 species of plants; Columbia, a country as big as New Mexico and Texas combined, has more than 1,550 bird species (twice the number round in North America); a single river in Brazil harbors more species of fish than all the rivers in the U.S....A world record was established in 1988 by Alwyn H. Gentry who identified about 300 tree species in each of two one-hectare (2.47 acres/hectare) plots in Iquitos, Peru.” (de Miranda, pp. 155-156).

“The Amazon River drainage basin alone supports about 5,000 kinds of fishes, nearly equal to all those in the Atlantic Ocean, while little Panama boasts as many plant species as the entire continent of Europe.” (Richard Nalley, Science Digest, p.56)

“Tropical rainforests are also important because they supply a great variety of commercial and noncommercial products: timber (some highly prized woods such as teak, mahogany, and rosewood), fuel wood, fruits, vegetables, nuts and spices, medicines (a quarter of all medically-active substances come from tropical plants [including treatment for childhood leukemia], and...around 70% of the 3,000 plants identified by the U.S. National Cancer Institute as having anti-cancer properties are tropical rain forest species.” (de Miranda p.156)

The rainforest provides a virtual pantry of goods commonly used including canes and fibers like bamboo, rattan, and jute (for rope, twine and burlap), fruits and veggies like avocados, bananas, mangos, papaya, passion fruit, and pineapple, spices and flavors including allspice, pepper, nutmeg, cinnamon, vanilla, paprika, cloves, and ginger, oils like camphor, coconut, sandalwood, and palm, medicines like curare, ipecac, and quinine, and a host of other things like Brazil nuts, cashews, and tea. (NWF Educator’s Guide, P.17)

Other products like sugar, peanuts, and sesame seeds are thought to have their origin in tropical habitats, and for products like corn, rice and bananas, tropical forests “offer genetic improvements of several major crops...In 1970 the U.S. corn crop was hit with a blight that destroyed half the crop in many areas. The costs amounted to \$2 billion in one year...[but] the crisis was remedied through interbreeding an immune form of corn that originally derived from the ancestral home of corn, Mexico.”

There are several other products that have a crucial link to the tropical forests. One is chewing gum which comes from the chicle tree. Another is rubber which comes from rubber trees and is used for commercial and industrial purposes around the world including balloons, erasers, globes, tires, hoses and shoes. Yet another is coffee which comes “courtesy of a bush in Ethiopia’s forest. Being the ancestral source of all coffee plantations throughout the tropics, this wild bush continues to supply germplasm material to boost coffee productivity and to resist diseases.” The other is chocolate which “originally derives from the cocoa tree native to western Amazonia and the Pacific coast of Ecuador.” (Lessons, Norman Myers, pp. 16-18)

Finally, some of the richest ore bodies are found in the Amazon including iron, manganese, cassiterite, bauxite, gold, copper and nickel. And there is also great hydroelectric potential in the area with 45% of Brazil’s hydro potential in the Amazon basin. (de Miranda, p.159)

[Side note: One last area of benefit of tropical rainforests often cited concerns its natural impact on climate and flood and erosion control. Forests obviously have a great influence on holding soil in place. Forests also have “sponge effect” that act to soak up some rain and prevent flooding during heavy rain season. But further, Myers (and others) argue that as the green band around the equator becomes more “bald,” there will be an increase in the “shininess” or reflectivity of the earth’s surface, causing an “albedo effect” that could influence convection currents, wind patters, and rainfall regimes throughout the tropical zone. The other area is global warming (fossil fuel emissions account for 5 billion tons of carbon annually while forest burning allegedly accounts for 2 billion). But this is a topic for another day since there are many, many serious questions about the whole premise of global warming. Finally is talk about the rainforests supposedly being the “lungs” of the planet, even though 70% of our oxygen is thought to come from algae.]

Some History on Development

“From its mountains you may dig silver, iron, coal, copper, quicksilver, zinc and tin; from the sands of its tributaries you may wash gold, diamonds and precious stones; from its forests you may gather drugs of virtues the most rare, spices of aroma the most exquisite, gums and resins of the most useful properties, dyes of hues the most brilliant, with cabinet and building woods of finest polish and most enduring texture. Its climate is everlasting summer, and its harvests perennial.” Matthew Maury, Amazon booster, 1850’s

“Europe and its children, the white-skinned cultures of the temperate zone, began to confront the tropical world more than five hundred years ago, driven by a craving for profits. Commercial capitalism spread worldwide from northwestern Europe, promoted by gunboats and colonial bureaucrats.” (Lessons, Richard P. Tucker, pp. 39-40)

With so much to offer in the way of valuable natural resources, the rainforests of the world have long been objects of interest to those looking to take advantage of their storehouses of wealth. Many would view this as good and noble, with men trying to

make their lives and the lives of people around them better through the creation of jobs, new and useful products, and increased economic growth and prosperity.

But for most environmentalists currently writing on the subject, the story of man's impact on the rainforest is nothing but one of exploitation. Tucker tells of how in SE Asia, the extraction of spices, woods and other products were done for 300 years without hurting the forest ecosystem. And in Africa, only small amounts of hardwood and oil palm nuts were harvested. But in the America's there was a different fate. "Some New World forests were entirely eliminated by plantation agriculture before the French Revolution transformed Europe's colonial regimes. The agent was sugar, the first widespread tropical monocrop....The Portuguese, taking control of coastal Brazil after 1530, leveled a long forest belt, replacing it with sugar plantations." These sugar plantations were later moved to Caribbean islands. And besides sugar, hardwood timber was the other early-modern rainforest export.

From the 1830's onward, coffee became a key Latin American export and took over much land in Brazil, Columbia, and Central America. By the mid to late 1800's, rubber and the search for unclaimed swaths of rubber trees had sent prospectors through more than 11,000 waterways making up the Amazon since the process of rubber vulcanization was discovered around that time. Soon after, there was a rubber boom in the region. But by 1910, there was a crash in the Amazon market as lower cost-rubber tree plantations were set up in tropical Asia. Henry Ford actually established a million-acre rubber plantation in Brazil, "Fordlandia," — the first large-scale monoculture plantation in Amazonia. But it failed for two ecological factors: the use of a floodplain forest species on the upland terra firma and a leaf rust fungus that attacked the leaves. In the tropics, there is usually a considerable distance between trees of the same species, probably as a defense against diseases and pests afflicting species that grow together. But Fordlandia tried to buck this and lost. (Lessons, Prance, pp. 59-60)

"Tropical fruit plantations followed sugar as the conquerors of lowland moist forests... and by the 1950's tropical governments and multinational corporations were competing for control over natural resource systems" Tropical timber industry also had massive acceleration after 1950. What made a lot of this possible were new bulldozers and gas-powered logging trucks that could now penetrate deeper into forest and provide far more timber. (Tucker, pp. 42-49)

One story that for many symbolizes the quest for wealth in the Amazon is the legend of the Golden King, El Dorado. "In its original form, it referred to a king with wealth so vast that each day he was anointed with precious resins to fix the gold dust decorating his body. The chronicler Oviedo recounts how the famous conquistador Pizarro who triumphed over the Inca...and Sebastian Ben Alcazar, the conqueror of Quito, not sated by such victories, all hankered for more gold and glory through the capture of the king and his possessions. In 1540, inflamed by this vision, Gonzalo Pizarro, brother of the conqueror of Peru, decided to launch an expedition with Francisco de Orellana to conquer the lands of El Dorado and the cinnamon forests. With four thousand Indians, two hundred horse, three thousand swine, and packs of hunting dogs trained to attack Indians, the expedition made its way

laboriously through the tropical forests on the east side of the Andes. Hapless forest tribes encountering this army faced an inquisition. When they denied knowledge of the kingdom of El Dorado, they were promptly tortured as liars, burned on barbacoa, or thrown to the ravenous hounds.

“As the expedition descended the Coca watershed towards the Napo river, their provisions — and their Andean Indian bearers — gave out...Disheartened and starving, Pizarro ordered the construction of a raft, sending his second-in-command Orellana ahead to find food. Orellana and his fifty companions never returned. Instead they became the first white men to descend from the headwaters to the mouth of the Amazon. Incensed by the treachery of Orellana and frustrated in his attempts to seek out the kingdom of El Dorado, a furious Pizarro made his return to Quito.” (The Fate of the Forest, Cockburn, pp. 6-7)

As for recent deforestation, there are currently three main factors: “(1) agricultural and livestock expansion (human population growth leads to expanded needs for crop and grazing lands); (2) increased demand for commercial forest products (national economic development and international trade stimulate mainly timber harvesting); and (3) increased demand for noncommercial forest products (fuel wood, fodder, and others). (de Miranda, pp. 156-157)

According to Al Gore in “Earth in the Balance,” “Wherever rain forests are found, they are under siege. They are being burned to clear land for pasture; they are being clear-cut with chain saws for lumber; they are being flooded by hydroelectric dams to generate power.” (Gore, PP. 117-118)

RATES OF DEFORESTATION: FOOTBALL FIELDS OR NOT EVEN ENOUGH FOR A FIRST DOWN?

Environmental Claims

“With the simple ax, the mighty chainsaw, and all-powerful fire, humankind has chipped away at the earth’s rich mantle over the centuries. Since settled agriculture began about 10,000 years ago, forests and woodlands have dwindled by nearly five billion acres — a third of the original total. For many centuries, this shrinkage of forest cover hindered human progress little, if at all. Indeed, the clearing of trees to make way for cropland and pasture, and the harvesting of wood for fuel and timber, were vital to economic and social development. But in recent decades, the scale and pace of deforestation have greatly accelerated. Each year 28 million acres of tropical forest are destroyed through the combined action of land clearing for crop production, fuelwood gathering, and cattle ranching. Commercial timber harvesting degrades at least an additional 11 million. All told, an area of trees slightly larger than New York and Vermont is lost or logged over each year.” (Sandra Postel, Worldwatch Institute)

So is rainforest loss, as Postel suggest, nearly 40 million acres per year – the alleged equivalent of one football field per second? Well that's the number U.S. News and World Report used as its figure in a major article debunking environmental myths. But other environmentalists use slightly lower figures.

In its publication, "Keeping Tropical Forests Alive," the World Resources Institute says, "Every year, at least 27 million acres of tropical forests are lost — an area the size of Pennsylvania, Ohio or Virginia. That's almost 74,000 acres a day — 3,000 acres an hour." (Which by the way also equals 50 acres per minute, or just under one per second). This number apparently good for Richard Nalley who wrote in Science Digest "man is currently slashing and burning away our rain forests, each year gouging a chunk larger than Virginia from an area roughly the size of the continental U.S. At this rate, all but the most remote lowland rain forest will be stripped bare within 30 years."

And this number also seems to be good for the National Wildlife Federation, which in a pamphlet co-produced with the World Wildlife Fund called "Tropical Forests: A Resource for the Future" said "Tropical deforestation is occurring at the rate of more than 50 acres per minute. An area the size of New York state is destroyed each year. This rate is high enough to ensure that many countries will be entirely stripped of primary forest within the next decade."

Or is this number good for NWF? In its Educator's Guide, a sidebar column said 51 million acres of tropical forest is lost each year (equal to 140,000 acres per day, 5,800 per hour, 96 per minute, and 1.6 per second).

And how about Al Gore? Well in his book, he says "[rain forests] are disappearing from the face of the earth at the rate of one and a half acres a second, night and day, every day, all year round." This works out to be about the same number NWF uses in its Educator's Guide.

But lest we forget one of the largest Green groups on the issue, the Rainforest Action Network, they say all these numbers are too low and claim almost two and a half acres per second are wiped out (two U.S. football fields) with 150 acres per minute, 9,000 per hour, about 214,000 per day (an area larger than all of New York City), and 78 million acres per year (an area larger than Poland).

Why these claims are wrong

While some advocates like to make grand, sweeping statements about rainforest loss and put in big numbers that make it sound catastrophic, Roger Sedjo and Marion Clawson, writing for Resources for the Future, dug into the available evidence and said, "Information about the tropical moist forests is relatively scant. What information we do have comes from anecdotal evidence — provided by isolated investigations at single times and places — than from systematic studies conducted over large areas and lengths of time... A hard look at the available data supports the view that some regions are experiencing rapid deforestation. However,

the view that this is a pervasive phenomenon on a global level is questionable.” (Rational Readings, Julian Simon, p. 745)

So what does available evidence show? And where do environmentalists begin to get their numbers? Well U.S. News and World Report (12/13/93) explains that while the figure of 40 million acres per year “has taken on a life of its own,” it is being “cited and recited without reference to its origins. Yet almost half the estimated total comes from a very rough estimate made by a Brazilian scientist who used sensors on a U.S. weather satellite to count the number of fires burning in the Amazon at one time in 1988 [at the height of government-subsidized deforestation]. He estimated the size of each, [guessing at the number of acres being cleared by each fire then assumed that 40 percent would never return to their forested condition, and finally doubled this number to arrive at an estimated guess for global deforestation.] The resulting number was into the widely cited report by the World Resources Institute...that helped fuel the alarm over vanishing tropical forests; [and] was cited by Gore and other administration officials last spring in announcing support for the Biodiversity Treaty.

“Last summer, two American researchers [David Skole of University of New Hampshire and Compton Tucker of NASA] took a more careful look. Armed with 210 overhead photographs of the Amazon region taken by Landsat satellites, they compared images from 1978 and 1988, painstakingly entered into a computer every tiny forest clearing, road, and power-line right of way. They found the average rate of rainforest loss was 3.7 million acres per year, or about one-fifth the widely accepted number.”

According to the book, “Eco-Sanity,” “If deforestation in Brazil accounted for half of all rainforest deforestation in the world, as is generally assumed, then the new estimate means the global rate of rainforest deforestation was just 3 million hectares per year (app. 7.5 million acres) during much of the 1980’s. As a percentage of existing rainforests, the annual loss was less than a tenth of one percent.”(Eco-Sanity, p.84)

Another important fact, according to Sedjo and Clawson, relates to a study done by the Food and Agriculture Organization and U.N. Environmental Programme by J.P. Lanly. Lanly is Forest Coordinator for the UNEP/FAO Tropical Resources Assessment Project and his study “indicates that [of the roughly 7 million acres worldwide per year] the undisturbed or “virgin” broadleaved closed forests have a far lower rate of deforestation than the total, being only 0.27 percent annually as compared with 2.06 percent annually for logged over secondary forest.

This figure indicates that deforestation pressure on the more pristine and generally more genetically diverse tropical forests is quite low.” Further, “these findings are in sharp contrast to the conventional view that the tropical forests are ‘disappearing at an alarming rate’ and suggest that concerns over the imminent loss of some of the most important residences of the world’s diverse genetic base, based on rates of tropical deforestation, are probably grossly exaggerated.” (Simon, Rational Readings, p.746)

Sedjo and Clawson also said “While the local effects of rapid deforestation may be severe, the evidence does not support the view that either the world or the tropics are experiencing rapid aggregate deforestation. Furthermore, the evidence shows that current rates of deforestation are quite modest in much of the world’s virgin tropical forests, for example those of the Amazon; and therefore they are probably in little danger of wholesale destruction in the foreseeable future.” (Eco-Sanity, p.90)

Sandra Brown, professor of forestry at U. of Illinois and Ariel Lugo, project leader at the U.S. Forest Service’s Institute of Tropical Forestry in Puerto Rico also studied available data and “concluded the ‘dangerous’ misinterpretation and exaggeration of the rate of deforestation has become common.”

As for the amount of deforestation in relation to total forest area, Thomas Lovejoy, then of the World Wildlife Fund, offered a low projection of 50% deforestation between 1980 and 2000 in Latin America and a high of 67%. The source for this was a set of satellite photos taken in 1978 and reported in the Washington Post to show that “as much as one-tenth of the Brazilian Amazon has been razed.” But according to Fulbright scholar and ecologist Robert Buschbacher working in Brazil, the Landsat photos “concluded that 1.55 percent of the Brazilian portion of the Amazon has been deforested.” “On the basis of this and other evidence, Buschbacher says, ‘Because of a relatively low percentage of forest clearing and the remarkable capacity of the forest to recover its structure...the threat of turning the Amazon into a wasteland is exaggerated.’

“Two U.N. studies and even [ecologist Norman] Myers agree closely in their estimates of the Brazilian deforestation rate — between 0.0025 and 0.004 percent per year...[so] even Lovejoy’s “low” assumption would be perhaps 10 times too high.”

M.K. Muthoo, leader of a FAO/UNDP Project Team, wrote in 1978, “Brazil has abundant natural forest. It holds that world’s biggest tropical forest reserve, in the Amazon, which can be continuously used and improved at the same time, but has hardly been tapped.” (Rational Readings, Simon, pp.745-746).

According to Sedjo, 76 percent of the tropical forest zone is still covered with forest. (True State of Planet, p. 199)

And even the “usually panic-stricken Worldwatch Institute reported in 1992 that ‘with nearly 90 percent of its groves still standing, by national or international standards, the Brazilian Amazon is relatively untouched.’” (Eco-Sanity, p.89)

Two other factors affecting deforestation are also worth noting. First, is that not all deforestation is the same, or has the same characteristics. For example, while much attention is paid to so-called “rainforest” destruction in the Amazon, according to wildlife ecologist Thomas Lacher of Texas A&M, fires reported for Legal Amazonia are very often in the savannah areas where ranching and other activities are being conducted, but it is made to sound like it is in the middle of lush, green jungle.

“Amazonia consists of several types of forest and a large expanse — more than a third of the region — of savannah (cerrado) and semidesert (chaco). ‘The cerrado

and chaco are being destroyed at a much faster rate than anything else,' Lacher says. 'The rate at which they're being gobbled up by soybean plantations is staggering. Then comes the dry forest, and last is the moist forest. So the actual wettest forest, which is what most of the attention is focused on, is not being hit as much as people sometimes think.' (Science, p. 737)

Lacher also discusses the second factor which is that deforestation rates are not fixed. He notes that most of the deforestation in the Amazon has taken place "along peripheral areas" of the basin and has not been in the heart of the rainforest. He contends there are not roads and other ways to get into the deeper interior — "no way to get in, so it's not going to happen." [Dr. Nigel Smith says the national integration highways "remain but a hairline fracture across a sea of forest" and says there is a trend towards use of second growth, or improving existing pasture, rather than clearing mature forest — noting that second growth communities are often closer to the roads and old enough to generate sufficient ash for fertilizing crops].

Lacher calls the conjecture about the rainforest on the verge of disappearing "unwarranted speculation." He further talks about how "ill-conceived deceived development schemes" attracted poor people to try and settle in the rainforest, that they were "encouraged to move in," but that they were not adequately backed up with technology transfer, etc. (Phone interview, 11/96)

One of the most infamous of these "schemes" was the vast Polonoroeste settlement program in Rondonia, funded by the international capital of the World Bank (with Thomas Lovejoy one of the advisors). "Before 1989, tax credits, subsidies, and inexpensive loans were given to people who carved farms out of the Amazon rainforest. Laws required owners to clear their properties to receive title to the land, encouraging property owners to clear much greater areas than they expected to farm...[but] many of these policies have been repealed or reformed since 1979...the rate of deforestation in Brazil thus has fallen dramatically." (Eco-Sanity, p.89)

Backing this idea up is Robert Schneider of the World Bank, who said deforestation rates increased as a demographic transition spread into the rain forest, but "since 1989, the demographic transition has decreased dramatically and so has the rate of deforestation." (The Dartmouth Review, "Bungle in the Jungle," Eric Hagen)

Dr. Nigel Smith concludes this area by noting, "In spite of popular belief that the Amazon forest is being totally destroyed, the scale of the region and the concentrated nature of many of the development thrusts have prevented any major ecological catastrophe thus far." (Smith, "Global Land Use Change," p.240)

KILLING OFF THE SPECIES OF THE EARTH?

"As many as half of all the living species on earth — some experts actually claim more than 90 percent of all living species — find their homes in tropical rain forests and cannot survive anywhere else. For that reason, most biologists believe that the rapid destruction of the tropical rain forests, and the irretrievable loss of the living species dying along with them, represent the single most serious damage to

nature now occurring... the wholesale annihilation of so many living species in such a breathless moment of geological time represents a deadly wound to the integrity of the earth's painstakingly intricate web of life, a wound so nearly permanent that scientists estimate that recuperation would take 100 million years." – Al Gore, *Earth in the Balance*, p.116

"Unknown plants and insects may touch our hearts less than the whales or jaguars, but in the long run they might have been more useful to people and central to the functions of their ecosystems in ways that we cannot imagine. At the present rate, many of them are dead for the rest of history, extinguished by fire, mercury, dioxin, and the loss of the agents of their survival, whether a pollinator, a dispersal agent, a particular type of soil, or a particular tree." – Alexander Cockburn, *Fate of the Forest*, p. 58

One cannot enter a discussion about rainforest loss without talking about its effect on the earth's species. Indeed, with the rainforests thought to be home to at least an estimated half of all species, this is the number one reason advanced as to why we must stop rainforest conversion, and put through an international Biodiversity Treaty that could lock up most of the remaining areas.

Again, just as with talk about rainforest loss, the numbers concerning species loss are equally alarming, and depending on where you look, equally diverse. But generally, the numbers can be traced to two sources: "Dr. Norman Myers, a British ecologist who in 1979 predicted the loss of one million species by the year 2000 [in his famous book, "The Sinking Ark" where he warned the world could "lose one-quarter of all species by the year 2000"]; and Dr. Edward O. Wilson, a Harvard biologist who variously claims that 4,000, 30,000, or 50,000 species are lost each year." (*Eco-Sanity*, p.86).

So where do these estimates come from?

Well the answer is definitely not from direct observations. As accurately expressed by biologist Garret Hardin in a quote from Julian Simon, "it is unknowable how many species are being extinguished." (*Scarcity*, p.132)

Norman Myers himself says "Unfortunately, we live in a world without sufficient scientists, funding, and above all, time to undertake a conclusive check." And in 1989 he wrote, "Regrettably, we have no way of knowing the actual current rate of extinction in tropical forests, nor can we even make an accurate guess." (*Scarcity*, pp. 77 and 40)

So as is the case with many of the current alleged global environmental "crises," the predictions about species loss are not based on any real-world observations but rather, guesses and speculations that depend on questionable mathematical models.

Myers himself "offered no basis for his prediction other than to call it a 'reasonable working figure'... [And] Wilson cites as the basis of his prediction a mathematical equation known as the species-area curve that relates the size of an island to the

number of species found on it. An island 10 square miles in area, for example, is typically found to have half as many species as a similar island of 100 square miles. Wilson argues that tropical forests obey exactly the same rule as their size is reduced. By plugging into the formula the rate at which tropical forests are being cut down throughout the world — Wilson puts it at 2 percent per year — he obtains the figure of 50,000 species lost each year. (U.S. News, p.82)

Under this theory of island biogeography, “The rule that is followed for teaching purposes,” Wilson says, “is that for every 90% loss in area, the number of species that can live indefinitely there is cut by one-half.” (Science, p. 737)

Dr. Michael Coffman explains that island biogeography was first postulated in 1967 and “...is a set of theories of how population and genetic dynamics are affected when stressed on isolated islands in the South Pacific....It postulates that, like isolated islands separated by oceans, forested ecosystems that are separated or “fragmented” by “oceans” of cut-over land, housing tracts, parking lots, and roads are therefore isolated from each other.” To prevent this, corridors and reserves must be created to allow genetic material for the varied species to flow in and out of the natural habitats stabilizing the species populations.” (Coffman, “Biological Diversity,” p.2-3)

But there are several critical elements that cast a long shadow on this scenario. First is the obvious question of just how much rainforest is actually being lost. Wilson and others put in the high estimates, and get high numbers of species loss, but as seen in the previous section, the numbers they use are at least 4 to 5 times higher than, say, the estimates by Lanly.

But even with high estimates of rainforest loss, there are still problems with the “island biogeography” theory. To begin with, it requires two highly questionable assumptions. First is that islands and habitats are analogous. But they are quite different. Islands are surrounded by water which is hostile to most land species. Terrestrial habitat surrounded by land, which can be much more accommodating to migrating species.

“In an address before the National Forum on Biodiversity in 1986, Dr. Ariel Lugo pointed out that according to the only available study of the rate of increase in tropical secondary forests, almost half of the 11.3 million hectares of virgin tropical forest cut annually were turned not into wasteland — the equivalent of water in biogeographical calculations — but secondary forest.” Thus many species were able to survive quite well. (Science, p.737)

In fact, Brian Groombridge who edited the most recent edition of the IUCN’s Red List of Threatened Animals points out that “around 75 percent of recorded extinctions...have occurred on islands; almost all bird and mollusc extinctions have been on islands...very few extinctions have been recorded in continental tropical forest habitat where mass extinction events have been predicted to be underway.” (Stephen Edwards, “The True State of the Planet,” p.218)

The second bad assumption is that the relationship between species number and geographic area is linear or exponential, implying that an infinite increase in area would result in an infinite increase in the number of species. But research by Dr. Patrick Kangas at the U. of Maryland found as you continue to increase area, the numbers level off and there is a sort of diminishing return to area increase. (Center for the Study of American Business report on Endangered Species Act, p.40)

“There’s a finite number of species within any community type,” Kangas says. “As you continue to move out, the numbers level off.” So further increase in area does not produce concomitant increase in diversity, and as a result, habitats on upper, flatter part of curve can be reduced without substantial immediate species loss. (Science, p.738)

Although Wilson claims his species-area curve has been “established by hundreds of independent studies,” the criticisms of it are born out in real-world observations. “In the eastern United States, for example, during the first 300 years of European settlement, woodlands were broken up into fragments, none large than 1 to 2 percent of the original vast forest, but only three forest birds became extinct — the carolina parakeet, the passenger pigeon, and the ivory-billed woodpecker. Moreover, habitat loss probably did not play the major role in their demise: The parakeet and the pigeon were hunted to death. (U.S. News, p. 82)

“Look down at the eastern United States the next time you fly over it,” says U. of Oklahoma zoologist Dr. Michael Mares. “It used to be solid forest all the way to the Mississippi. Now it’s patches of isolated forest, exactly what we fear will happen to the tropics. But we didn’t have a massive die-off.” (Science, p. 738)

“Similarly, the Atlantic coastal forests of Brazil have been cut to about 12 percent of their original size, yet a team of Brazilian zoologists that combed the forests could not confirm a single case of extinction. Instead, they rediscovered several birds and six species of butterfly considered extinct 20 years ago. And a survey by the Flora Meso-Americana project found increased abundance of some species considered threatened.

“Despite extensive inquiries, we have been unable to obtain conclusive evidence to support the suggestion that massive extinctions have taken place in recent times,” writes Vernon Heywood, a former chief scientist of the International Union for the Conservation of Nature and Natural Resources.” (U.S. News, pp. 82-86)

Another real-world observation that casts doubt on the Wilson theory actually comes from an island, Puerto Rico, where according to Lugo, human activity reduced the area of primary forest by 99%. “But because of extensive use of coffee shade trees in the coffee region and secondary forests, forest cover was never less than 10 to 15%...[and] in an analysis of bird fauna, [it was] concluded that seven bird species (four of them endemic) became extinct after 500 years of human pressure...and that exotic species enlarged the species pool. In the 1980’s, more birds were present on the island (97 species) than were present in pre-Columbian times (60

species)...Secondary forests in Puerto Rico have [also] served as refugia for primary forest tree species as well.” (Lugo, “Biodiversity,” p.66)

So what do real-world observations say about the worldwide loss of species? Well in response to questions about species extinction, the World Conservation Union (IUCN) commissioned a book in 1992 to look into the matter. According to Simon, all the authors are ecologists who express concern about the rate of extinction. Nevertheless, they all agree that the rate of known extinctions has been and continues to be very low.

They found, “60 birds and mammals are known to have become extinct between 1900 and 1950,” “actual extinctions remain low...many species appear to have either an almost miraculous capacity for survival, or a guardian angel watching over their destiny,” and not “a single known animal species...could be properly declared as extinct, in spite of the massive reduction in area and fragmentation of their habitats in the past decades and centuries of intensive human activity.” (Simon, Scarcity or Abundance, pp. 200-202)

So given all of this, why do environmentalists persist in using grandiose numbers to express their concerns about species loss? Dr. Julian Simon notes that “biologists with whom I have discussed this material agree that the numbers in question are most uncertain. But they say the numbers do not matter scientifically. The conclusion would be the same, they say, if the numbers were different even by several orders of magnitude. If that is so, why mention any numbers at all? The answer, quite clearly is that these numbers do matter in one important way; they have the power to frighten in a fashion that numbers much smaller would not. The [Congressional Office of Technology Assessment] OTA 1986 document says: ‘Conveying the importance of biological diversity will require a formulation of the issue in terms that are easily understandable and convincing.’ These frightening numbers meet that test. I can find no scientific justification for such use of numbers.”

Thus, the lack of any evidence for mass extinctions causes no hesitation on the part of those environmentalists calling for quick and draconian action.

The Preamble of the U.N. Biodiversity Treaty admits there “is a general lack of information and knowledge regarding biological diversity,” but says “where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.”

And Norman Myers says that “Given that we are witnessing a mass extinction of exceptional scope, should it not be sufficient to make a best-judgement assessment of what is going on...[and] should the burden of proof not be shifted onto the shoulders of the skeptics and have them prove their point rather than the reverse?

But the bottom line, as expressed by Ariel Lugo, is this. “We are asking Latin countries to go to enormous efforts on the basis of a scientific theory that is full of uncertainties.”

IF ONLY PEOPLE WOULD GO AWAY

“We are, in effect, bulldozing the Gardens of Eden.” – Al Gore, *Earth in the Balance*, p. 144

“Then, from the center of the glowing ring of fairies, Magi Lune...spoke. `Since the beginning of time, we have been the guardians of the forest. But we have grown lazy. We have forgotten the magic of nature.’” – Dialogue from children’s movie: “Fern Gully: The Last Rainforest”

“The region is a welter of putrefaction, where men die like flies. Even with all the money in the world and half its population it is impossible to finish this railway.” The [British] Public Works Company, 1873

“Malaria, the most common of tropical diseases... takes many forms and went by many different names: calentura, miasma, the shakes, the chills, paludism, ague, pernicious fever, putrid fever, intermittent fever, and in its most virulent form, Chagres fever...The typical malarial attack began with terrible chills, uncontrollable shivering, and chattering teeth, the spell lasting perhaps fifteen minutes, sometimes more. Often the shivering of patients in a malaria ward would be so violent that the room could actually be felt to tremble; a single bed would move on the floor. The chills would be followed by high fever and a burning thirst. As the fever fell off, the patient would break out in a drenching sweat. For those who survived, the experience was unforgettable.” “The Path Between the Seas: The Creation of the Panama Canal 1870-1914,” p.139

Listen to environmentalists speak about the rainforest and you get the idea that it is an ancient and natural paradise, untouched and unspoiled by human hands until recent times. The first point in a “visions of the rainforest” essay in a Sierra Club book flatly states, “The rainforests are fragile, nonrenewable resources.” (Lessons, p.7)

Another says “Tropical treetops were the womb and nursery of humankind...It comes as no surprise to me that we have a deep aesthetic love of forests; in our desire to preserve them, we are also preserving something of ourselves.” (Lessons, Donald Perry, p.27)

Yet another essay in the same book says that in regard to making use of the rainforest, development is a “manifest destiny” of modern times and that “the idea of progress is deeply rooted in Western thought and has been widely incorporated in the beliefs of many in Third World...We must...create alternatives to the worldview of the economist.” (Lessons, p.172)

And throughout nearly all discussion of the rainforest, the idea is presented that only indigenous tribes and their “earth- friendly” technologies are suitable for this pristine environment. Peoples like the Kayapo and Yanomami “possess a thorough understanding, much of it encoded in myth” according to Alan Durning of the Worldwatch Institute who relays how one tribesman in Brazil said “The only one who

know how to defend the forests are we who have lived here for a hundred years or more — the rubber tappers and the Indians.”

The absolute fact, we are told, is that once a piece of rainforest is gone, it is gone forever and that the intrusion of people is simply bad for this wondrous ecosystem. But once again, reality is quite a bit different from perception.

Dr. Nigel Smith, a professor of geography at the University of Florida is a leading expert on the issue of the Brazilian rainforest and in his landmark paper, “Human-Induced Landscape Changes in Amazonia and Implications for Development,” he begins by saying “One of the most persistent myths about Amazonia is that it has long been a wilderness, virtually untouched by humans until relatively recently. Amazonian forests are often portrayed as sparsely settled or essentially empty until modern times.” As a result, he claims “The perception of Amazonia as raw, untamed nature awaiting modern development with few precedents has led to some inappropriate policy decisions.”

Smith further notes that while such ideas “widely disseminated in the media and among decision-makers in sociopolitical life have created the impression that Amazonia is essentially a ‘clean-slate’...this latest wave of clearing is taking place on landscapes that have often been through several slash-and-burn cycles in the distant past.”

Hunters and gatherers, he says, entered Amazonia from various directions at different times and undertook many activities in the rainforest. They “burned grassland and scrub to flush game and kill small animals, thereby creating more open habitats,” and created landscape changes that became more pronounced when “large scale farming came on the scene. Maize has been cultivated in the Ecuadorian Amazon for at least 6,000 years and root-crop farming began long before that, particularly with cassava (manioc), sweet potato, and the New World yam. By the time the Europeans arrived, many parts of the Amazon basin were being farmed, and settlement was particularly dense along silt-laden rivers.”

“Estimates of human populations in Amazonia around A.D. 1500 range from one to almost seven million...[and] substantial parts of Amazonia must have been cleared at some time of contact to support several million people.” This has been backed up as “pioneer highways and accompanying settlements have exposed numerous black earth sites with pottery on a wide variety of soil types suggesting that sizeable and sedentary populations once occupied ‘pristine’ upland forests.”

Smith goes so far as to state, “In spite of the development push that began in the 1960’s, it seems unlikely that the area cleared today is any larger than it was in 1500...the area of forest is probably greater now than when the Europeans arrived.” (Smith, pp.231-245)

In a telephone interview, Smith summed up these facts by simply saying that “while we can talk about mature or relatively undisturbed rainforest, there is no such thing as virgin tropical rain forest any more.”

Thus, just by simple logic, this means that the idea that once rainforest is gone, it is gone forever is obviously a myth. If people have been in the forests for centuries, clearing huge areas for agriculture and other purposes, and now it's hard to even find evidence of their civilization, the rainforest obviously grows back quite well. Travel to Mexico, for instance, and see ancient Mayan ruins that have only recently been discovered because entire cities have been swallowed up by the reforested jungle, and this will be more than clear.

In fact, at Dartmouth University, Thomas Lovejoy was recently giving a lecture and showing pictures of Amazon land that had been deforested only four to five years before. The regrowth in these areas was "verdant and vigorous; the canopy had ascended to a height of nearly 25 feet. In order to study an 'island' of rainforest, it must remain isolated, surrounded by cleared land. So when asked if the second growth interfered with his project, Lovejoy jokingly admitted, 'Well we have a chain saw.'" (Dartmouth Review, p.8)

Nigel Smith points out that "a pattern of waxing and waning of forest cover is not unique to Amazonia. The forests of New England in the United States, for example, are more extensive now than they were during the time of the colonies. The oak forests of southern England, severely cut back in Roman times, had largely returned by the time Henry VIII assumed the throne, only to be felled again for iron smelting, building materials, and agriculture." (Smith, p. 238-239)

As for whether the activities of people can only be a detriment to the natural order, Dr. Michael Mares, in a phone interview, asserted that "pristine habitat being disturbed can actually increase the number of species found in that area." Lugo notes that secondary forest can "constitute a landscape with greater species richness than found in a landscape dominated only by climax forests." (Lugo, p. 67) And Smith says that through "widespread interaction with the forest and intimate knowledge of its resources...indigenous groups have enriched the forest...with various useful plants, particularly fruit and nut trees" and created what some refer to as "cultural forests" within the Amazon.

"In summary," Lugo states, "strong evidence can be assembled to document the resiliency of the functional attributes of some types of tropical ecosystems (including their ability to maintain species richness)...We cannot tell the need of the tropical world that they must cease and desist in their struggle for survival to prevent a catastrophe whose dimensions, consequences, or mitigating conditions we cannot define with any certainty...I know of no technical reason why sensible land management in tropical areas cannot lead to the success that is usually associated with temperate zones [in the developed world]." (Lugo, p.68)

WHERE TO GO FROM HERE?

In a book on Brazil written in 1961, you can read "If people are to have better jobs and make enough money so that they may have better homes and food and clothes,

Brazil must develop her resources and expand her industries. Areas like the Amazon Valley, and much of the interior, must be fully explored. Already, new mineral deposits have been found. There is still much land that could be farmed. If all the land in Brazil were properly used, there would be plenty of inexpensive food for everyone.” (“Let’s Visit Brazil, p. 87)

For quite some time, this idea of wisely developing the natural resources of a nation and improving the lives of its people was the common thinking of the day. But that was 1961. This is 1997. And instead of looking to a place like the rainforest to see how man and nature can work together for the benefit of both, the Green view of today is to put an iron gate around the rainforest with a big “Keep Out” sign clearly posted.

Concerning forest clearing, the Sierra Club says “protection is the most obvious alternative” and goes on to say that instead of development, solutions to address “population growth and poverty” should come through so-called “family planning, basic health services, and literacy campaigns.” (Lessons, p.7)

Already, protected areas or parks now occupy 13.2% of all of South America. The Pan American Railroad proposed to link North America with Chile is virtually blocked since every possible route must pass through a protected area. (Eco-logic report, p.12) And if the U.N. Biodiversity Treaty goes through, massive stretches of additional forest will be forever locked away with access in and out regulated by international bureaucrats or the non-governmental organizations (like Rainforest Action Network, National Wildlife Federation, and World Wildlife Fund) they charge with oversight.

Is this the best solution? Certainly, tropical rainforests are a valuable ecological entity. “They provide erosion and flood control, timber and forest products, medicines, wood fuel, outdoor ‘laboratories’ for scientific research, and of course, a habitat for millions of plant and animal species. When developing these areas, it is important to formulate a biodiversity strategy with rational rules...” (Dartmouth Review, p.8) But that does not mean all-out preservation is the only answer.

Dr. Vernon Heywood says “biodiversity is not equally distributed throughout the world” so by protecting “specific, critical habitats within forests,” “a small amount of conservation can skew the curve.” “He cites a study of African birds which indicate that 95 percent of species are found within areas already protected; three quarters of southern Africa’s native plants are found in reserves as well.” (U.S. News, p.86)

Julian Simon notes that “recent scientific and technical advances — especially seed banks and genetic engineering — have diminished the importance of maintaining species in their natural habitat.” (Scarcity, p.43)

And as already noted, secondary forests often provide better habitat for a multitude of species. In fact, “there are some cases in the Amazon where creation of reserve areas — in an effort to protect rain forest — is leading to a simplification of the ecological systems and to a loss of biological diversity.” (de Miranda, p.163)

And what about the people? Environmentalists may like to keep development out of the Third World and maintain it as some kind of giant wilderness refuge they can visit now and again, but that is hardly in the best interest of the citizens there. And as for the indigenous tribes, they may like to glamorize the lifestyle and discuss it in terms of the noble savage, but as expressed in "The Cross and the Rainforest," "the lifestyle of the rainforest Indian, weaving bodily adornments from leaves and living off nutritious bark and berries, probably holds more charm for white, middle-class environmentalists than it does for the Indians." (p. 147)

Yes, there can be development and environmental protection. Sure many parts of the rainforest have soils that are not best for agriculture. But soil scientist Dr. Edward Krug contends rainforest soil is not "unique" and is "very similar to that of the southeastern U.S." which may not offer optimal conditions but has proven value for many crops.

Robert Schneider of the World Bank says, "What we're seeing is that people are figuring out what you can and cannot do as far as what crops you can grow, what crops you can grow in which soils, where you can put crops when you have to put in pasture, and which fertilizers can be used successfully." (Dartmouth Review, p.8)

Additionally, areas can be developed for particular purposes that can benefit people while reducing impact on more primary forests. In one case, a company has developed a eucalyptus tree that when grown in the rainforest, grows quickly, has a minimum of side branches (which reduces the amount of room it needs), matures in only seven years instead of the 12 it takes in Spain and Portugal or 35 in northern Europe, and can be used for paper production. Said one company spokesman, "We do not cut the Amazon and replace it with eucalyptus — we plant on land...which has already lost biodiversity...By giving this land an economic function, we are preventing further incursion into the Amazon." (Financial Times, 1/8/92)

In the tropics right now, "the large part of wood harvested comes from plantations." Brazil is adding almost 500,000 thousand acres of forest plantation each year, and although these "account for only 2 percent of its forests, they provide 60 percent of the wood harvested." According to Roger Sedjo, "The world's current industrial wood consumption requirements could be produced on about 500 million acres of good forestland, an area only about five percent of the world's current forestland...Natural forests no longer serve as a major source of industrial wood." (Cross and the Rainforest, p.146)

Studies show that even areas that have previously been degraded or completely deforested can have their biodiversity restored. And according to de Miranda, they can even more importantly attain a "new agricultural transformation to recover their biological and production potential."

No matter what is done in the rainforest, however, the need for progress among the peoples of the developing world should not be overlooked. The old Chinese proverb says that when there is food on the table, there are many problems, but when there is no food on the table, there is only one problem.

Environmentalists may suggest, as they do in the Sierra Club publication, that “acknowledging the earth’s sacredness,” providing a “holy and awesome restoration of Nature herself,” and having a “reverence for trees” are the only things that “can serve as a worldview.” But that is not going to feed hungry mouths or provide a better life for the millions who must depend on the earth’s natural resources for their sustenance.

Sedjo leads us to at least part of the solution when he affirms, “countries that have achieved economic development almost always had an early period in which forestlands were rapidly converted to productive agricultural lands. Thus conversion is not necessarily undesirable. Forested areas provided the agricultural land that allowed the development of Europe and North America...In summary, economic development promotes forest stability through well-defined and recognized property rights, the enforcement of property rights, the absence of government subsidies to encourage land clearing, and high levels and growth rates of agricultural productivity.

“Historically, humans everywhere have interacted with and ‘disturbed’ forests...In purely economic terms, the actual stock of forestlands exceeded the stock desired by humanity, while the actual stock of farmland was less than desired. Thus there were incentives for adjusting those stocks by converting forestlands into more highly desired agricultural lands. This adjustment does not imply that the conversion trend will continue until all the forests are gone, however.

“The first sentence in Marion Clawson’s *Forests for Whom and for What?* begins, ‘Forests serve the American people in many ways and have the potential to serve more people in better and more generous ways.’ This same insight can be expanded to include all of humanity and all the world’s forests.” (*True State of the Planet*, pp. 204-205)

Indeed, even the Amazon rain forest!

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