Society of American Foresters

International Forestry Working Group Newsletter

Working Group B3

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Contributed Articles

Urban Forestry Professor Zhu Ning Honored with USDA Excellence in Teaching Award

Dr. Zhu H. Ning, Professor of the Urban Forestry and Natural Resources Department at Southern University was honored with the *United States Department of Agriculture Excellence in College and University Teaching Award* on Nov 13, 2016 in Austin Texas, during the Association of Public and Land-Grant Universities (APLU) annual conference.

Dr. Zhu Ning received the USDA Excellence in Teaching Award.

Through an USDA national expert panel review and APLU competitive selection process, Dr. Ning was chosen as one of the eight winners among the outstanding nominees who representing the nation's universities.

During the National Awards Program, Sonny Ramaswamy, Director of the USDA NIFA, introduce and presented the award to Dr. Ning. To honor the award recipients, the APLU presented the awardees with a Golden Apple Award Trophy at its Award Luncheon.

According to the USDA and the APLU, this National Awards Program recognizes the extraordinary efforts of educators who distinguished themselves in a field of hundreds of thousands of men and women who work tirelessly to improve the world through their research, instruction and community engagement. Established by the Secretary of Agriculture under the authorization of the National Agricultural Research, Extension, and Teaching Policy Act, the National Awards Program focuses national attention on the role of teaching; fundamental to recruiting and retaining the scientific and professional expertise essential to the future growth and progress. The Award is to honor excellence in teaching by recognizing faculty who both practice and promote effective, innovative teaching. Recipients exhibited sustained, meritorious and exceptional teaching achievements.

Throughout her career, Dr. Ning has obtained $20 million in competitive grants to support education, research, and student professional development. She has provided experiential learning opportunities for students, such as global competency study abroad, an absolutely life-changing experience for students. She has organized workshops, symposia and forums to enhance education and research. She is highly regarded as an urban forestry expert at regional, national, and international levels. With 190 publications, she has integrated research into teaching, nurtured scientific curiosity, and motivated students to a new height.

Her exemplary achievements have earned her James and Ruth Smith Endowed Professor Award, Chancellor's Award for Teaching Excellence, Chancellor's Award for Most Outstanding Researcher, College Faculty Excellence in Research Awards, Department Excellence through Faculty Excellence Award from the Louisiana State Board of Regents of Higher Education, and awards from Louisiana State Governor.
Ning has a long history in contributing to SAF through her service as the SAF Urban Forestry Working Group Chair, International Forestry Working Group Chair, Chair of the National Committee on Cultural Diversity, and National Convention Program Committee Chair. She also served as a member of SAF National Committee on Leadership Development, National Committee on World Forestry, Education Program Review Criteria Committee (to develop Urban Forestry Education Program Accreditation Standard), and SAF representative in the Sustainable Urban Forestry Coalition. Her leadership and collegiality spirit has resulted in three SAF Working Group Merit Awards for contribution in forest science programs.

For more information please contact

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Short Fiction:

31 October 2016

Back In Borneo: A Trip Report

F.E. "Jack" Putz (fep@ufl.edu)

Barreling down a provincial road through rural Indonesian Borneo in a double-cabbed pick-up truck, a worker riding in the back tapped on the roof to signal the driver to pull over for a stop. I was happy for a break because my 64-year old bones had been taking a beating for several hours and I needed to pee. The road was recently paved, which allowed spurts of high-speed travel, but the many factory-bound trucks overloaded with oil palm fruits had already caused the potholes to be frequent, deep, and hard to avoid.

Despite the jarring, I had been drowsily watching the passing scenery of seemingly abandoned farms, fragments of degraded forest, many small-holder and a few large corporate oil palm plantations, and plenty of roadside stores that all seemed to sell glass bottles of diesel and various sundries, most of which were on display. My mission was to observe the timber harvesting operations in a logging concession that was recently certified as responsibly managed by the Forest Stewardship Council (FSC). My secondary mission was to return to a place I had visited at roughly decadal intervals for 40 years. The roof tapper was an employee of the logging concession and son of the Punan Dayak man with whom I had first visited this area on foot in 1976. Accompanying him in the back was another forest worker from the company, a most striking fellow from Flores.

The man from Flores reappears at the end of this story but for now deserves some introduction. First of all, his height, dark skin, and curly hair distinguished him from the locals, but there was something in the way he carried himself, even in what might seem humble circumstances riding in the back of a pickup. His voice was deep, his diction clear (probably because he had learned Bahasa Indonesia in school) and his manner forthright but polite. Although his island home is among the poorest in the Indonesian Archipelago and workers from Flores (and nearby Timor) are often assigned the most menial tasks, this man was obviously among the elite. His job was to run the cable yarder I had come to see in action. He had learned to operate excavators modified for log yarding as a visiting worker in Sarawak. His prowess at the controls of that ungainly machine were responsible for a doubling of the productivity of his crew. Given that crew members share their log volume-based incentives, he was one popular fellow. As we bounced along it was easy to imagine him as some lofty personage being paraded around to receive the adulation of his subjects.

As by far the most senior of the passengers in the truck's interior, the tallest by a head, and the only person of European descent, I was riding shotgun, which was only moderately terrifying. Fortunately for my state of mind, the seatbelt worked. The driver was a 30-odd year old man from Sulawesi. On one of our previous stops he told me that he'd worked for several years across the border in the Malaysian state of Sabah. Despite what sounded like being kidnapped, worked as a

slave (because his boss kept his passport), and otherwise mistreated, he'd managed to save some money. With his modest salary as a driver for the logging company, he was hoping to open a roadside shop of some sort with his wife, a Kenyah Dayak woman. Sitting behind me chatting happily amongst themselves were three Javanese foresters, one a research colleague and friend, in the middle was the silviculturalist from the concession to which we were headed, and then there was another, slightly older man whose story I never quite figured out—perhaps he was the silviculturalist's assistant. I'd met the silviculturalist several years before when he worked in what, at least from a forester's perspective, was a well-run timber concession in West Kalimantan; based on our conversations then and on this trip, I hoped he would pursue a Ph.D. with me back in the states.

[Note that in this trip report I will not specify names or places so as to protect the mostly innocent. While some readers might be able to figure out where and with whom I most recently travelled, I would rather they didn't. First of all, this is a work of fiction pieced together from actual events that occurred at various times and places in the region. Then there is the fact that I am trying to convey what I find to be difficult-to-unravel events put in play by actors whose behaviors are hard for me to understand and who occupy frequently changing and otherwise complex social, economic, and political environments. Finally, I must admit that my fluent Pasar Malay (the *lingua franca* of Malaysia) is often not up to the challenge of the much more sophisticated national language of Indonesia; I am even worse off in the various Dayak languages, Bugisan, and Javanese. The result of my various limitations is that, as barely conversant outsider, this story is undoubtedly peppered with mistakes and misinterpretations. It would be easier if there were good guys and bad, the gibbons won, and the streams continued to run clear, but that is simply not the case in the real world of Indonesian Borneo.]

I first visited the spot where the truck stopped in **1976** when I walked the same ridgeline along which we were driving. I was with a Punan Dayak man from the village on the banks of the meandering river in the valley below. I had arrived the day before after an excruciatingly long trip by a sometimes motorized dugout and he was guiding me on foot over the ridge into the next drainage from which I hoped to make my way into the real ulus in the highlands. My Peace Corps service completed, the shambles of an ill-advised marriage behind me, and several months free before starting graduate school, I was on what the Aussies would refer to as a "walk-about."

From the floor of a Bornean rainforest there are few vistas--often the position of the sun is even difficult to determine--but even from back in those pre-GPS days I could always recognize the spot from the general lay-of-the-land. My first visit was particularly memorable due to a bird durian tree with fruits on which we gorged ourselves while enjoying the melodious duets from a nearby family of Bornean gibbons—I didn't speak gibbon at the time and sadly still don't, but they were clearly complaining about having to wait their turn at the durians. Those fruits were my guide's property because his father, or perhaps it was his grandfather, had either planted that tree or saved it from being smothered by vines. On his way home later in the day after he sent me on my way, when he passed by he would fashion a large backpack-basket from split rattan canes, fill it with fallen fruit (only fallen durians are ripe and ready to eat), and enjoy a hero's welcome back in his village.

Ten years later (**1986**) I was back in Borneo as a young faculty member on a research mission to a logging concession that had been granted in the same area. The 150,000 ha concession was

licensed to a parastatal corporation on whose board sat several military men and cronies of Bob Hassan, the Al Capone of Indonesian forestry. I was able to visit because the logging was subcontracted to a Malaysian Chinese firm with which I had worked since my Peace Corps days. The "jalan kanchil" (mousedeer trail) along the ridge that I walked ten years previously had been converted into a logging road, but the durian tree still stood, sadly fruitless. The other big change was that, before the company started logging operations a few years previously, all the people from the village below and the two dozen other settlements within the concession had been relocated to new riverside villages near the company's log pond.

"Transmigration" in Indonesia is often regarded as involving Javanese or Madurese farmers relocated to Kalimantan or Sumatra, but in this instance it involved more geographically constrained movements of local indigenous people referred to collectively as "Dayaks." The Dayaks that formerly resided in the government-granted timber concession actually represented at least three distinct groups, but when they were resettled these distinctions were disregarded. In the new villages, which were bunched together, each "transmigrant" family was provided with a wooden frame house with a metal roof as well as access to government schools and health clinics. They were also granted land on which to farm, but the entire resettlement area was all claimed by a different Dayak group, which resulted in conflicts. The government actually expected the transmigrants to abandon slash-and-burn agriculture in favor of salaried jobs with the logging company, but other than occasional day labor, this seldom happened. The subsistence-farming and forest-product-collecting backgrounds of the Dayaks, coupled with their dense schedules of holidays, rendered most of them culturally unsuited for steady work. Instead, their new livelihoods derived from a complex and erratic combination of sales of rattan canes, dammar resin, songbirds, and bushmeat combined with itinerant wage labor. Also, as logging roads penetrated the forest, most farming families took advantage of free rides on logging trucks to return to their former village lands inside the concession. Even back then, the land tenure ambiguities that emerged from conflicts between traditional ("adat") and national laws restrained the company's efforts to exclude locals from their traditional territories.

When I returned in **1996**, the familiar terrain had been reshaped to construct a log landing. The durian tree was gone, most likely due to collateral damage from "selective" logging of the red meranti (*Shorea*) trees that were scattered through the area. Due to the recent log-export ban, wood from those trees was hauled to the river, rafted to the coast, barged to Java, converted into plywood, and sold to Japan where it was used once for concrete forms and then discarded. Some logs from that stand undoubtedly made their way to mills in Sabah where there was a lively trade in illegal logs. Those illicit sales might have been made by illegal loggers, but were more likely made by the logging contractor who wanted to avoid the steep royalties collected by the Indonesian government, not to mention some of the under-the-table payments demanded by corrupt officials along the log market chain.

From the log landing where we ate the rice-and-fish lunches that were neatly packed for us in folded banana leaves, I could see that the logging had been unnecessarily destructive to both the residual trees and soils. Engaged as I was in an industrial scale research project in Sabah on what we called "reduced-impact logging." I was attuned to violations of sound timber harvesting practices. I could see, for example, that the bulldozer used to yard the logs to the landing had plunged directly down the slope below the road with its blade down and that, subsequently, no

efforts were made to control erosion from the resultant skid trail. To be fair, the newly opened vistas allowed me to see that much of the forest remained unscathed probably due to the sparse and scattered distribution of merchantable timber. That I couldn't hear the calls of shamas, bulbuls, or babblers, suggested that bird hunters for the pet trade had taken advantage of the increased access to ply their illegal but seldom-sanctioned trade. On the bright side, I could hear gibbons hooting in the distance, perhaps relatives of the family I'd met a decade before.

In **2006** I was headed back to the same? Or another one established after 1994 when the timber industry saw the disappearance of many large concessions and repositioning of most of the same actors into smaller management units forest concession. Large-scale commercial logging in the immediate vicinity of my spot had ceased probably because the two harvests in rapid succession had mined out most of the valuable timber. Small-scale informal extraction continued, as indicated by the Dayak men busily producing chainsaw lumber. Dayaks are legally entitled to harvest for their own use the wood of Bornean ironwood (ulin), the most prized of these heavy hardwoods, of which I saw plenty for sale along the roads. With so much local construction underway, there was plenty of demand for that wood.

With the large logs gone, it was no longer worth the logging concessionaire's effort to prevent encroachment by Dayak farmers, and several had already colonized roadside areas. Although Dayaks traditionally farmed near the rivers that provided access, they readily shift to roadsides because travel is faster than on meandering rivers. In regards to their rights to this land, they had never wavered in their claims.

Directly below my spot, which was now on an abandoned log landing covered by alang-alang grass and scrambling ferns, the erosion gully and compacted subsoils of the skid trail were still evident. Trees on both sides of that gully were felled and awaiting the drier weather of September to burn, after which it would be planted with hill rice. It's easier to fell forests on slopes, and it burns better as well, but subsequent soil loss rates are high and a year or two of cropping is the most that can be expected. Other than the scattered and small farms most of the logged-over forest still stood, but some large stands of pioneer trees indicated that this area did not completely escape the extensive 1997 El Niño fires.

A few years before my **2016** visit, the logging road had been converted into a provincial road and paved, with the log stringers of the bridges replaced by steel. At about the same time, the Ministry of Forestry had now officially changed the land use from natural forest management to industrial pulpwood plantation. This change in status was likely related to the redrawing of the concession's boundaries when a new license was negotiated by a new company, the ownership of which I could not determine.

For a kilometer or two before reaching my spot, the scenery had changed dramatically. Gone were the forests and, in their place, were monotonous monocultures of *Acacia mangium*, an Australian species grown for pulp. Fiber farming has its place, and there may be situations in which industrial plantations relieve pressure on natural forests, but I am admittedly not a fan and react poorly when plantations are confused with forest. That said, those damn trees can sure grow at phenomenal rates, even on poor soils. Planted stands can be clearcut after just 6-7 years, by which time the trees have grown to 30 cm in diameter and harvestable volumes exceed those of

many mature natural forests. As might be expected, yields decline after the first rotation, which means that more fertilizer needs to be used, but so far, no one seems concerned. Harvested logs are trucked to the coast and barged to Sumatra where they feed a monster pulp and paper mill paid for with international development aid.

From my old spot I could see that plantations stretched to the horizon, which was now visible because all the high forest was gone. The only exception, and it was a prominent one, was immediately downhill from the road where someone had cut down the acacias to plant cassava. Not only had they cut down 3-year old plantation trees with trunks already a hand-span in diameter, when they burned the slash they let the fire creep off into neighboring stands they hadn't cut—the cleared field covered about a hectare, with fire-killed trees of about twice that size.

That someone had the gall to slash-and-burn a commercial plantation owned by a major corporation surprised even jaded me, but there it was. I mistakenly assumed that the Dayaks who farmed the area a decade before had just returned for another cropping cycle. Instead, they had sold five hectares of their land to a man from Sulawesi with money in his pocket from having worked for several years in a Malaysian oil palm plantation. I was further informed that, despite evidence to the contrary, this Bugis man was not a subsistence farmer; instead, he planned to clear all his land and then plant oil palm. With the road paved and frequent trucks ferrying fruits to the factory only a few hours away, transportation was not going to be a problem. Given that oil palm plantations produce 30 tons of fruit per hectare per year from which 3 tons of oil can be extracted and sold for $600 per ton, he was on his way towards relative wealth. My Dayak colleague was obviously impressed by the fellow's foresight, but made a point of telling me that most of the work on this incipient plantation was actually done by Timorese people from a nearby government-sponsored transmigration village. It was these workers who had cut and burned the acacia and planted the cassava.

By late afternoon we had traversed the *Acacia* plantation and made it to the logging camp, but not the one where I had stayed on previous visits. The camp I remembered was in the center of the concession but this one was outside the forest at their log pond on the banks of the river down which they rafted logs to the sea. Although the facility was rather new, the landscape around the workshops was already adorned with plenty of large, rusty, and I presumably dead bulldozers, road graders, and the like**.** The guest house, and all of the buildings for that matter, were constructed from beautiful wood that the company had trouble selling but that would fetch a pretty penny in lumber yards in Europe or the USA. I could hear a diesel generator thumping away and, because it was still roasting hot, I was pleased that there was an overhead fan in the room to which I was assigned. I recalled that in the old camp in the forest interior, other than at midday, the temperatures were moderate and the nights downright cool. Not so in this new camp, presumably because it is surrounded by plantations--trash the air conditioner and heat happens. That deforestation is followed by increased ambient temperatures is a frequently voiced perception of country people in Kalimantan.

The next morning we bumped our way for a few hours to the logging area to watch the modified excavator in action. Perhaps I shouldn't have been surprised, but given that the logging concession was recently FSC certified, I was a bit taken aback by the number of small farms

within its perimeter and by the number of people passing by on motorbikes on the concession's roads. When we passed one fellow on a 125cc Yamaha, I noticed a small wooden chest of drawers strapped to the seat in place of a pillion rider. Each of the 20 or so drawers was perforated, the openings screened. He was carrying a long extendable pole like the lance of a jousting knight. It took me a minute to recognize the rig as that of a bird catcher. Later, when I asked about hunting in the concession, the silviculturalist explained that hunting was almost a religion to the Dayaks. He also explained that the saddlebags of the motorbikes might contain bushmeat from mousedeer, porcupines, or even small bearded pigs, but certainly all contained snares. That this rampant hunting might violate an FSC principle didn't seem to cross his mind. For my part, I would draw the line at bird trapping for the pet trade, but would have to waffle about pot hunting, if that is what was happening. Based on what I heard and saw that day, which is not much of a sample, I wouldn't classify the area as a completely "empty forest," but the abundant fallen fruit under several trees suggested a scarcity of whatever it was that used to eat those fruits.

Before we arrived the excavator operator had positioned the yarder on a ridgetop logging road and was busily yanking 8-12 m long (3-6 ton) logs 100-150 m up a 60-70% slope. I clambered down to where the feller was working by following, in succession, the four men on the cable relay team. On the way back up I tried to follow a log as it was pulled to the roadside, but the haulback speed was impressive and I soon fell behind. That was just as well given that the leaping log toppled some trees along the cableway.

Back up on the road I joined a group of men watching the yarding operations. A European visitor was enough of an event to draw a crowd, but it was clear that the main attraction was watching a master craftsman work the yarder's controls. Sorry, 'craftsman' does not capture what he was doing; it was more like watching a ballet dancer. With motions more fluid than might be expected for a behemoth of a machine he caused the massive logs to fly out of the forest, swung them up onto the road, and then used the grapple to manipulate them like pick-up-sticks for easy loading onto a waiting truck. Within less than two minutes, the cable relay team was ready to snake it back down for another log. I was not surprised that the machine's productivity with the man from Flores at the controls was fully double that of its previous operators.

I will not deny deriving guilty pleasure from watching that large machine at work, but my reactions to the cable yarder in action were not simply testosterone-fueled. First of all, the damage done by this logging operation was a small fraction of what would have been caused if the same harvest were to be carried out with bulldozers. Whereas cable yarders snake logs through the understory, ground-based yarding operations, here carried out with bulldozers, require that skid trails be opened. On slopes, especially where soils are wet or otherwise of low trafficability, the surface is scraped off with every pass to increase traction. To negotiate steeper slopes, bulldozers need to cut switchbacks, which results in huge amounts of mineral soil exposure and causes extensive residual stand damage. In response to that sort of treatment, pioneer trees proliferate and cover the wounds but thereby delay timber stand recovery for decades.

Despite the environmental benefits of selective logging with cable yarders compared to bulldozers, it seems obvious to question whether such slopes should be logged at all. There are no such restrictions in North America or Europe, but with incidences and depths of flooding of

coastal cities in Borneo both increasing, such a restriction might be warranted. And although cable yarders do not need so many skid trails, they still need roads and roads cause many problems. Fortunately, given that the costs of timber harvests go up and the profits go down with increasing slope angles, why not avoid the costs and cash in on carbon payments instead—emissions would certainly decline and the collateral benefits to biodiversity and hydrology would sweeten any climate change mitigation deal.

I suggested this course of action to the group of heavy machinery operator wannabes while we sat around chatting at lunchtime. No one responded to my proposal, which is fairly typical in Indonesia, but later the silviculturalist pointed out that local Dayak villagers would be none too happy about restrictions on access to the forest where they hunted, made chainsaw lumber, and collected rattans and other commercial non-timber forest products. The surprised look on my face must have clued him in about my cluelessness, because he then went on to explain that they would be even less happy to forego the $18 per cubic meter royalty they received from the concessionaire for logs harvested from within what were historically their village areas. Although yields from the second harvest were half of the first, the company was still getting 30-40 m^3 per hectare. That per cubic meter sum surprised me because it's about half of what the concessionaire earns, if our estimates are at all accurate. It also concerned me was that, despite decades of experience in the region, I was still missing much of what was really happening.

Later, in private, my research colleague told me something that even more clearly revealed the profundity of my ignorance. A few years prior to our visit when royalty negotiations between the Dayaks and the concession broke down, the camp where I'd stayed in 1996 and 2006 had burned to the ground. No charges were ever filed but, after that, the royalty requested by the villagers was accepted.

On our last day in the concession we had planned to visit an area where the silviculturalist was experimenting with a new approach to enrichment planting. From his description it seemed like a far more environmentally sound and less expensive approach than the strip planting along cleared lines method advocated by the Ministry of Forestry. No one explained to me why that visit was cancelled but later, when my colleague and I were on our way back to the district capital, he revealed the reason. Apparently the road into the enrichment planting area had been blocked by villagers in an attempt to influence the on-going negotiations over next year's royalties.

Based on my observations in the concession, I was supposed to help design a rigorous and independent evaluation of the on-the-ground impacts of FSC certification of natural forest management in the tropics. After more than 20 years of trying to reform forest industries by "rewarding the good players" and investments of what I estimate at more than 100 million dollars, it seems high time for this promising intervention to be evaluated. Unfortunately, what I learned from my most recent visit to this forest made me face the fundamental question of what reasonable expectations for the FSC? For example, one common prediction is that, if the FSC is being effective, then deforestation rates within certified concessions should be lower than in properly matched un-certified counterfactual concessions. But to the extent that certified concessions respect the rights of displaced Dayaks with legitimate land claims, the opposite might be expected. Similarly, I am not sure how much we should expect FSC certified concessions to control hunting, given the cultural traditions and livelihood needs of local people. Finally, is it

reasonable to expect FSC certified concessions to no log on slopes >40% (xxx degrees) in tropical countries when such a restriction would substantially reduce harvestable areas, not to mention the lack of such restrictions elsewhere?

Back from Borneo, I resumed my university teaching duties, which included a course on conservation biology. The topic of one of the first classes was the "zero deforestation" pledges being made by many large corporations with cattle ranches, soybean farms, and oil palm plantations in the tropics. In preparation for the class, we'd all read an encouraging essay about the apparent emergence of corporate social and environmental responsibility. Given my confused state of mind, which I hope was conveyed in the trip report you just read, I was fortunately spared from having to state my now muddled opinion about the issue. Instead, I was asked to review the calculation of net present value and interceded when a correlation was assumed to indicate causation, but was otherwise comfortably swept along by their enthusiasm. Somehow I had lost my footing on the slippery slope of real world conservation. Call me a coward, but from my comfortable perch in an ivory tower with running water, dependable power, and fast internet, I find it hard to point fingers.

IUFRO Task Force on Biological Invasions Meets in USA

Andrew Liebhold, Task Force Coordinator (and coordinator of RG 7.03)

Summary: Biological invasions by non-native plants, insects, plant pathogens, mammals and other organisms are altering forest ecosystems and threatening the sustainable management of forests worldwide. The IUFRO Task Force on Biological Invasions is working on the synthesis of the current scientific knowledge on invasions as well as identifying knowledge gaps. A meeting of the task force in the USA made progress toward these goals.

Meeting Report

The IUFRO Task Force on Biological Invasions held a meeting at the US Fish & Wildlife Service National Conservation Training Center, Shepherdstown, WV, USA 18-21 July, 2016. The meeting was attended by 60 scientists representing Argentina, Canada, China, Hungary, India, Italy, Japan, Kenya, New Zealand, South Africa, Sweden, Switzerland, United Kingdom and the USA. The meeting started with a keynote address by Dr. Michael Wingfield, IUFRO President and Director of the Forestry and Agricultural Biotechnology Institute, at the University of Pretoria, and was followed by 24 invited review presentations by task force members as well as 17 contributed presentations by others. The last day of the meeting was devoted to a field trip to Shenandoah National Park to view forest invasions problems first hand. A series of review papers authored by task force members will be published in a special issue of the journal "Biological Invasions" in 2017. The workshop was attended by 36 other individuals with backgrounds ranging from scientists to policy specialists. A total of 17 contributed presentations were also made.

Topics of presentations included the ecology of biological invasions by various animal and plant taxa, their impacts and management. These presentations demonstrated how invasions are having profound effects on forests worldwide. While progress has been made in managing invasions, the problem still represents a formidable problem. Synthetic concepts emerging from the workshop included:

- Research on biological invasions in forests requires cross-disciplinary collaboration
- Uncertainty is a central problem – predicting future invasions and their impacts is challenging
- Multi-species interactions are key to understanding the impacts of invasions
- More work is needed on understanding the social and economics impacts of invasions
- There often considerable time lags between the arrival of alien species and their impacts – this creates problems for their management
- There is a need to better understand the social processes that drive invasions
- There is a need to enhance global networking and exchange of information on biological invasions
- The lack of resources for research and management in countries with developing economies is a problem that affects all countries

Hyperlinks:

Task force page: http://www.iufro.org/science/task-forces/biological-invasions
Shepherdstown Meeting page: https://sites.google.com/site/iufroinvasions2016
Photos: https://sites.google.com/site/iufroinvasions2016/home/photo-gallery

Tropical Logging Exaggeration

Frank H. Wadsworth

The following article, published recently in the French forestry journal *Bois et Forets des Tropiques*, pleased me in that It confronts complaints that are commonplace claiming that logging is destroying much tropical forest.. The author, apparently a logger, documents the impacts of the several operations of timber harvesting in per cents of the forest affected

DESTRUCTION OF FOREST AREAS AS A RESULT OF LOGGING AND HARVESTING IN AFRICAN OR AMERICAN DENSE TROPICAL RAINFORESTS

J. Estève

Articles in the media that point to logging as the main driver of tropical forest loss have become commonplace. However, this is a misconception that can be attributed to inadequate knowledge of actual forest conditions on the one hand, and to the conflation of logging and agricultural clearance on the other hand. This article, written by a practitioner with a thorough knowledge of the tropical forest context, sets out to assess the impacts of logging on dense tropical rainforests in Africa and South America. In the interests of accuracy, the article distinguishes between the different phases of a logging operation: establishment of the base camp, building of logging roads to ship out the timber and actual felling. Different scenarios are described according to the richness of forest environments, where harvested volumes vary from 3 to 15 m3/ha. These estimations confirm that the destruction of forest cover is so low that, except in radical situations, logging is not a threat to the sustainability of tropical forests. Opening up road networks and logging roads affects 4.5% to 5.5% of forest cover. Clear-felled areas never exceed 4% of the forest cover and the figure drops to less than 2% in highly or moderately species-rich forests. Logging is therefore directly responsible for only 5.5% to 8.5% of forest destruction. Although the figure can rise to 12% to 16% in rich forest environments, it does not take into account the natural dynamics of biomass reconstitution between logging sequences. In Southeast Asia where logging is more intensive due to very high commercial potential, forest cover reconstitutes within 20 years. While the economic value of dense tropical rainforests declines with logging, their ecological and biological value remains virtually intact.

The author concludes that logging operations collectively as per cents of the forest, are so small that logging may be no threat to forest sustainability and may leave the ecological and biological forest values intact. Determination of tropical forest sustainability and ecological completeness do not result from the per cents alone. These require assurance of resulting changes in the forest structure and composition over a period of time by someone who understands forest ecosystems. Despite this, were the author in the US, his article could be accepted from a SAF member qualified to practice sustainable forest management. It is a pity that SAF does not require the "understanding" of forests in its definition of foresters and forestry practices that affect delicate, rare, and fragile species inseparable from forest ecosystems. It permits an unnecessary rift between forestry practices and underlying forest ecology.

International and national efforts to reduce illegal timber trade need to factor in the many facets of unlawful forest uses

Just Published:
Daniela Kleinschmit, Stephanie Mansourian, Christoph Wildburger & Andre Purret (eds.), 2016. Illegal Logging and Related Timber Trade - Dimensions, Drivers, Impacts and Responses. A Global Scientific Rapid Assessment Report. IUFRO World Series Volume 35. Vienna. 148 p.
ISBN 978-3-902762-70-2 ISSN 1016-3263
Published by International Union of Forest Research Organizations

Illegally harvested and traded timber continues to strongly impact our environment, societies and economies, including endangering biological diversity and climate change mitigation.

Despite long-standing international efforts to combat illegal logging and related trade, these phenomena seem to be persistent at the global level. This is mainly because stricter regulations in some countries re-route illegal timber to less regulated markets, and the majority of illegally harvested timber is traded domestically. Also, organized criminal networks are increasingly involved in illegal logging.

These are some of the key messages of a new study that was successfully launched on 3 December in Cancun, Mexico, in the context of the 13th Conference of the Parties to the Convention on Biological Diversity (CBD COP13).

The new report “Illegal Logging and Related Timber Trade - Dimensions, Drivers, Impacts and Responses” is the most comprehensive scientific analysis to date on illegal logging and available response options. More than 40 renowned scientists from around the world collaborated on the study, coordinated by the International Union of Forest Research Organizations (IUFRO) on behalf of the Collaborative Partnership on Forests (CPF).

“Policies must embrace the major dimensions of the problem, namely *illegal forest conversion*, *informal logging* and *all other illegal forest activities* including forest crime”, said Daniela Kleinschmit, University of Freiburg, and the Chair of the assessment on “Illegal Logging and Related Timber Trade”, which has been undertaken by IUFRO’s Global Forest Expert Panels (GFEP) initiative.

“In view of these various dimensions we must also recognize that illegal logging is not merely a forest-related problem to be resolved by the ministries dealing with the forest and environment sectors alone”, said Alexander Buck, IUFRO Executive Director. Illegal conversion of forests to agricultural land is an example that clearly shows the need for a broader cooperation, in this case between forestry and agriculture. After all, it is estimated that almost one-third of tropical timber traded globally is illegal conversion timber.

This assessment report and the accompanying policy brief provide an authoritative source of information for policymakers and stakeholders involved in the fight against illegal logging and associated timber trade, in order to support effective action in tackling this pressing global problem. Both publications are available for download at:
http://www.iufro.org/science/gfep/illegal-timber-trade-rapid-response/report/

Photo © IUFRO
Press Briefing on 3 December in Cancun, Mexico, in the context of CBD COP13

Participants from left to right:

Mr Alexander Buck, IUFRO
Mr Raimundo Deusdará Filho, Brazilian Forest Service
Mr Braulio Ferreira de Souza Dias, CBD
Ms Daniela Kleinschmit, University of Freiburg, Germany
Mr Paolo Omar Cerutti, CIFOR
Mr Erik Solheim, UN Environment
Ms Eva Müller, FAO

Invitation to join IUFRO email lists

The International Union of Forest Research Organizations hosts email lists of interest to tropical foresters.

General information on joining and using the lists can be found at http://www.iufro.org/science/iufro-mailing-lists/

The lists of particular interest in tropical forestry include

RG 1.02.00 – Tropical and subtropical silviculture – See http://www.iufro.org/science/iufro-mailing-lists/list-management/rg-10200/ for subscribing

WP 1.02.04 – Sustainable management and genetic resources in Meliaceae – See http://www.iufro.org/science/iufro-mailing-lists/list-management/wp-10204/ for subscribing

Discussion within WP 2.08.07 – Genetics and Silviculture of Acacias See http://www.iufro.org/science/iufro-mailing-lists/list-management/wp-20807/ for subscribing.

For other elists of general interest, please see http://www.iufro.org/science/iufro-mailing-lists/overview/

From the archives:

Tree Planting in Luuq, Somalia, 1982

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More Information: http://esa.ipb.pt/seb2017/en/

Yale School of Forestry and Environmental Sciences
New Haven, Connecticut
For more information contact Pooja Choksi, pooja.choksi@yale.edu

Note from the editor

Feel free to send this newsletter on to others.

If you would like to be added to the distribution list for the newsletter, send an email to Blair Orr (blairorr@ymail.com)

- Blair Orr, IFWG Newsletter Editor
(blairorr@ymail.com)

Mollie Beattie Visiting Scholar Program

SAF is excited to announce that its new **Mollie Beattie Visiting Scholar Program** is currently seeking research project proposals with clear policy implications for forests and related natural resources in the United States. SAF established the new program using funds raised through the Mollie Beattie Fund to foster diversity in the natural resource professions by encouraging those from underrepresented groups to become foresters or professionals in other natural resource fields. The purpose of this visiting scholar opportunity is to advance the careers of young professionals and students through experience or research in forest and related natural resource policy. The program supports one graduate student, post-doctoral student, faculty, or early career professional (within 5 years of their degree) in forestry or related natural resource disciplines. Applicants from underrepresented groups in natural resources professions will be given first priority. Advanced undergraduates with strong faculty support may also be considered. The program is open to both US and non-US citizens. The application deadline is **February 3, 2017**. To read more about Mollie Beattie and get application instructions, click here.

The Forestry Source and 2015 Gregory Award Winners.

Be sure to check out the January edition of *The Forestry Source*, featuring photos, interviews, and stories from the 2016 Gregory Award winners, Anukram Adhikary of Nepal and Paula Sarigumba of the Philippines. We will be accepting applications for the 2017 award in early March. If you have any questions about the award, please contact Danielle Watson at watsond@safnet.org.

Join an SAF Working Group

As a member of the Society of American Foresters you can join SAF working groups by going to the website:

Join a working group here.

If you want to join this working group, we are B3, the International Forestry Working Group. Please pass this information along to SAF members who might be interested in joining a working group – especially B3, the International Forestry Working Group.

TROPICAL NOTES

Frank H. Wadsworth and Library Staff
International Institute of Tropical Forestry
USDA Forest Service
San Juan, Puerto Rico

Logging damage slight

Assessment of the impacts of logging on dense tropical forests in Africa and South America distinguishes base camps, logging roads, and actual felling where harvested volumes vary from 3 to 15 m3/ha. These estimations confirm that the destruction of forest cover is so low that, except in radical situations, logging is directly responsible for only 5.5 to 8.5% of forest destruction, no threat to the sustainability of tropical forests. In rich forest environments where damage may rise to 16%, natural reconstitution of biomass between logging sequences reconstitutes forest cover within 20 years, with the ecological and biological values virtually intact.

J. Esteve. Destruction of forest areas as a result of logging and harvesting in African or American dense tropical rainforests. [Bois et forets des Tropiques 328(2):5-12 2016]

Radiata economics

In Australia managers of plantations of P. radiata with negative values rated by “Future Rotations” are commonly blamed on the discount rate. A study shows that fires and other natural disasters are also causes. Expenditure on protection and precision silviculture may be justified. Replanting of “poor” stands contributes to losses. Replanting of stands of “mid-level” productivity results in 30% probability of economic outturn. In plantations of the “best” productivity replanting results in a low probability of loss. Stands that cannot be raised to a profitable level through precision silviculture should be converted to alternative uses.

Ian Ferguson Future Rotation [Australian Forestry 79 (2):122-125 2016]

Logging roads, access, but little damage

A review of 126 articles dealing with impacts and management of logging roads in tropical forests around the world for critical appraisal. BMT articles were focused on practical issues of road engineering. Articles in English were focused on impacts on forest ecosystems, loss of cover during construction, edge effects. And greater ease of access to the forest for hunting, and agricultural colonization. Despite continuing attention, little is known about how they evolve in the long run.

Fritz Klensvhroth. Logging roads in tropical forests" Synthesis of literature written in French and English: Highlights Environmental impact reduction through improved engineering.[Bois et Forets des Tropiques 328(2).]

Prunus africana in danger

The dried bark of *Prunus africana*, the African cherry, prized for its capacity to inhibit swelling of the prostate, is internationally traded more than any other African medicinal plant species, with African herbals reaching $220 million per year. The species is montane and subject to climate change. Concern for the future of wild stocks led CITES to list the species in Appendix II in 1970. Cameroon is by far the greatest supplier, followed by Uganda and the Democratic Republic of the Congo. Correct bark stripping removes only two strips from trees 30 cm in diameter. Stripping smaller trees is destructive.

High-grading vs. silviculture

In the mixed natural forests of New South Wales landowners prefer to high-grade their forests, repeatedly removing the larger trees, although this leads to productive decline. Restorative silviculture reverses tree selection, but up-front costs and payback times are deterrents.

V.A. Jay, Modelling the outcome of different silvicultural approaches on the private natural forests of northeastern New South Wales [Australian Forestry 79 (2):85-95 2016]

Australian adaptation

Victoria's Central Highlands forests have a highly variable climate and are well adapted to climate variation. Human induced changes in climate may require management options. This region has already experienced higher temperatures, less rainfall, and brushfires. Likely results include changes in phenology,

flowering, seeding and germination and shifts in forest composition, increasing stand and regional species diversity, employment of more drought or disturbance species or genotypes, and revised management prescriptions.

R. J. Keenen, Forest management options for adaption to climate change: a case study of tall wet Eucalyptus forests in Victoria's Central Highland Region.[Australian Forestry 79 (2):96-107 2016]

Oil-field rehabilitation

A test of 20 tree species on oil-field sites in the Ecuadorian Amazonia gave 80% success. Of those selected, the best early growth applied to Flemencia, Myrcia, Piptadenia, Platymiscium, and Zygia.

J. Villacis and others, Selection of forest species to rehabilitate oil fields in the Ecuadorean Amazon. [Science of the Total Environment 506-507:761-770 2016]

Radiata fertilized

In southeastern Australia a ten-year-old plantation of *Pinus radiata* was thinned and then applied with fertilizer. Levels of phosphorus ranged from 0 to 50 kg P/ha and nitrogen, 0, 150, and 300 kg N/ha. Significant responses over seven years were found with all treatments. The best was 150kgN/ha and 50kgP/ha with a 28% volume increase.

P. Green and others. Effects of fertilizer applications after thinning of *Pinus radiata* on a high elevation site in southeastern Australia.[Australian Forestry 79(3)]

Potential use of small logs

The production of high value sawlogs requires removal of smaller stems by thinning. To obtain required value from the small logs a new market must be developed. For high-energy value fuels the Fischer Tropsch synthesis appears to offer substantial advantages in the capacity to break down biomass by thermal decay and chemical reformation to form a range of high energy/value fuels. These processes are exothermic and produce process heat, electricity, and fuels concurrently.

J. Cummins and others. Using small hardwood logs to produce liquid fuels and electricity. [Australian Forestry 79 (3)]i

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Neem vs. termites

In India *Pinus radiata* is severely attacked by termites. In search for control the wood was heated from 180C to 220C for periods up to 90 minutes. Treatment alone was not effective. Adding to the thermal treatment a dip in 25% oil of neem seeds in linseed oil led to control, although the linseed oil was found ineffective.

Yasir Ullah Bhoru and other. Termite resistance of *Pinus radiata* D. Don wood after unified thermal and neem seed oil treatment [Indian Forester 142(9):882-890 2016]

Epiphyte loss in Sumatra

Epiphytes are especially victims of land-use changes in the tropics. A study of 120 30x30m plots in Bukit Duabelas National Park(Lowland rainforest) and surrounding jungle agroforestry and small jungle oil palm plantations and large monoculture rubber and oil palm plantations to compare the diversity of the epiphytes. Lowland rainforest and jungle rubber and jungle oil palm were indistinguishable as to richness, diversity, and evenness of epiphytes. Oil palm plantations had the greatest abundance of epiphytes, but these were dominated by a fern, leaving the least number of former species. Jungle rubber, a potential habitat for orchids and other epiphytes, is a disappearing practice. Species susceptibility is highest in oil palm plantations. There, several species could disappear.

Bohnert, Tim. Effects of Land-use change on vascular epiphyte diversity in Sumatra (Indonesia) [Biological Conservation 202:20-29 2016].

Windthrow in the Amazon

A torque study of 60 trees of 21 species ranging from 19 to 41 cm dbh. Resistance to failure increased with tree size and wood density. Within ecosystems trees were affected by topography, with higher winds on upper velocities. Differences in windthrow were due more to differences in wind at different elevations more than differences in soil properties.

Ribeiro, G. H. P. M. and others. Mechanical vulnerability and resistance to snapping and uprooting for Central Amazon tree species. [Forest Ecology and Management 380:1-10 2016].

Carbon in Mekong Delta mangroves

Mangrove forests are an important carbon sink. Evaluation of C storage in the Mekong Delta of Viet Nam provides important information for management, and reduction of emissions from deforestation. The mean C storage above ground for fringe sites was 102 ± 25 MgCh_1. For transition areas it was 298 ± 14 MgCh_1 and for interior forests it averaged 244 ± 40MgCh_1 Above and below ground C averaged 911MgCh_1and ranged from 765 to 1025. These data suggest that mangrove storage and emission controls are significant to management at both regional and national levels.

Dung, and others. Carbon storage in Can Gio Mangrove Forest Park, Mekong Delta, Viet Nam.[Forest Ecology and Management 380:31-40 2016]

Fire results in Eucalyptus

Mixed Eucalyptus forests are considered tolerant of fires because the big trees resprout. Most trees survive low-severity wildfires through resprouting. In high-severity fires up to 90% of the trees of 10-20 cm dbh are lost. In trees of more than 70 cm dbh losses average about 40%. Between 30 and 60 cm dbh some 75% survive. Prescribed burning has no clear effect on forest resistance to wildfire. Dependence on seedling recruitment thereafter could increase vulnerability to subsequent fires.

Bennett, L. T. and others Mortality and recruitment of fire-tolerant eucalypts as influenced by wildlife severity and recent prescribed fire [Forest Ecology and Management 380:107-``7 2016

Seasonal growth in plantations

Comparison of seasonal growth in plantations of native Brazilian tree species, Eucalyptus, *Pinus caribaea hondurensis* and *Pinus taeda* in Brazil showed growth of all species to be in response to seasonal temperature, water availability, vapor pressure, and evapotranspiration, Dominant trees were more responsive than suppressed trees. Understanding the relation between forest growth and meteorological variables may have practical application in evaluating climate change impacts on wood production.

Campoe, O. C. Meteorological seasonality affecting individual tree growth in forest plantations in Brazil. [Forest Ecology and Management 380:149-160 2016].

Acacia thinning in Viet Nam

Acacia hybrids are used for high-value sawlogs in Viet Nam. They are planted at 1,111 trees /ha. During the second year they are thinned to 833 trees/ha resulted in no loss of forest volume and an increase of mean dbh by 7.5%.It was concluded that thinning to 833 trees/ha at age 2 and to 600/ha at age 3 should assure trees of high diameter
Huong, V. D. and others. Growth and physiological responses to intensity and timing of thinning in short rotation tropical Acacia hybrid plantations in South Viet Nam.[Forest Ecology and Management 380:232-241 2016]

Communities and restoration of the Great Green Wall

Four cross-over border regions of the Great Green Wall of Africa includes Mali, Burkina Faso, and the Niger. Forest restoration focuses on the planting of well adapted and environmentally useful local plant species in agrosylvicalpastoral systems including tree, shrub, and herbaceous species. Participation included commitment of community-based structure and organization, sources for a nursery and other village work. The communities in these areas have always demonstrated perseverance in improving their environment and have reaped the benefits.

Sacande, M. and others. Community participation at the heart of Africa's Great Green Wall restoration model. [UNASYLVA 66:44-51 2016]

Bamboo restoration

International support is growing for bamboo for the restoration of degraded land. INBAR has tasked 40 nations to restore 5 million ha of degraded lands into productive, healthy bamboo forests. Bamboo needs to be brought into mainstream forestry location, inventories, and yields.

Rebelo, C . and others. Bamboo: the opportunities for forest and landscape restoration. UNASYLVA 66: 91-98 2016]

The white-sand forests of Acre

Within Amazonia topography, soil nutrients, and the water table combine to result in nine distinct forests in Acre. On six sites were found 170 woody species, many found in other white-sand areas in northern South America. The nine locations within Acre are strongly dissimilar, only two showing 50% similarity, that is 95% in Central and Eastern Amazonia and Peru. Acre's complex white-sand diversity

is not represented in southwestern Amazonia and should be given conservation priority.

Daly, D. C. and others. The white-sand vegetation of Acre, Brazil. [Biotropica 48 (1):81-89 2016].

Logging and mammal invasion

In Sabah, selectively logged rain forest has proven attractive to a non-native invasive rodent, *Rattusrattus*. *Rattusrattus* showed great preference for disturbed habitats. In contrast to native species *Rattusrattus* has taken to arboreal behavior and therefore increasing its invasive effectiveness. This is an example that directly threatens biodiversity by the creation of conditions that favor non-native flora.

Loveridge, R. and others. Movement/behavior of native and invasive small mammals show logging may facilitate invasion in a tropical rain forest.[Biotropica 48(3):373-380 2016].

Bushmeat pressure in Central Africa

Records of bushmeat take between 1990 and 2007 in Cameroon, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and Republic of Congo were compiled. IN mapping the take it was found significantly correlated with road density, distance to protected areas, and population density. The map of high-risk areas includes protected areas. It could serve conservation planning for the region.

Ziegler, S. and others. Mapping bushmeat hunting pressure in Central Africa [Biotropica 48(3):405-412 2016].

Precipitation and elephants in the Serengeti

The composition of the woody cover (Acacia) of the Serengeti savannah in Tanzania is the product of diverse forces. A system of 38 spanning the mean annual precipitation gradient was used to assess the relative roles of precipitation, soil texture, soil nutrients, fire, and elephant herbivory on tree community composition. No evidence was found as to the influence of fire. Comparison of elephant effects on tree species composition to that of community composition effects on elephant density. The former was found more likely. It is concluded that precipitation and elephant herbivory determine species composition in the Serengeti.

Rugimalila, D. M. and others. Precipitation and elephants, not fire, shape tree community composition in Serengeti National Park, Tanzania. [Biotropica 48(4):476-482 2016].

Firefly defence

Although well known for displays, fireflies (*Coleoptera Lampyridae*) also emit strong odors when molested. Two tropical fireflies emit pungent odors, glows, and flashes when handled. They were dominated by pyracine. Pyracine proved a repellent of ants. A toad accepted fireflies and two species of bats rejected fireflies. Because of multiple enemies, fireflies may have other defences.

Vencl, F. V. and others. Pyracine emission by a tropical firefly: An example of chemical aposematism? [Biotropica 48 (5);645-655 2016].

Feasibility of post-logging treatment

Selective logging, including Reduced Impact, leaves gaps in the forest with deficient regeneration. Of four treatment options compared, enrichment planting of commercial timber species in one-year-old gaps with competing vegetation removed proved profitable for a yield at 60 years, counting on growth rates increasing 25 to 50%, and 500% in timber prices, and interest rates of 4 to 6%. With newly developed silvicultural treatments profitability could increase.

Schwartz, G. and others Profitability of silvicultural treatments in logging gaps in the Brazilian Amazon [Journal of Tropical Forest Science 28(1):68-78 2016]

Oil palm diversification

Planting of indigenous tree species within oil plantation promises to increase diversity but requires knowledge of the adaptability of the trees to the specific environment. A planting of 351 trees (<1m tall) of various species in wet riverbank soil along a river within an oil palm plantation in Peninsular Malaysia gave a survival of more than 90%. Subsequent growth promises feasible increased biodiversity.

Yamada, T. and others. Growth and survival of trees planted in an oil palm plantation: implications for restoration of biodiversity. [Journal of Tropical Forest Science 28(1):97-105 2016]

Mammalian tourism limitations

In South-East Asia mammalian tourism is less popular than in Africa. In Endau Rompin National Park in Peninsular Malaysia potentially 149 small to medium sized mammals are found, but because they are in dense rainforest most visitors do not have high expectations regarding wildlife encounters, nor do many actually see wildlife.

Aihara,Y. and others. Mammalian wildlife tourism in South-East Asian tropical rainforests: The case of Endau Rompin National Park, Malaysia. [Journal of Tropical Forest Science 28(2): 167-181 `2016].Sonnerat

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A successful mangrove nursery

Establishment and operation of a mangrove nursery in Vietnam on the landward side of a sea dyke on acid sulphate soils generally considered unsuitable for mangrove proved successful. It produced 37,500 seedlings of *Avicennia, Rhizophora, Bruguiera, Sonneratia*, and *Nypa*. Seedlings were available for transplanting in three months and survival was high. Practices included the use of sea-bed mud to improve soils and planting of multiple individuals per plot.

Nguyen, T. P. and others. Mangrove restoration: Establishment of a mangrove nursery on acid-sulphate soils. [Journal of Tropical Forest Science 28(3): 275-284 2016].

Sustainability in Papua New Guinea

In three watersheds of northern Papua New Guinea 57 communities depend on forests for their subsistence. Wood extraction for fuel was 11.1 tonne household-1 year-1 and for construction 0.6 m3 household-1 year-1. At these rates these communities can harvest construction wood sustainably for 55 to 90 years.

Page, T. and others. Sustainability of wood use in remote, forest-dependent communities of Papua-New Guinea [Forest Ecology and Management 382 88-99 2016].

Pine and fire in the Canary Islands

Fire-scarred *Pinus canariensis* trees were analysed to record fire history on three western islands. Prior to 1960 fires occurred every 2.5 to 4 years. Climate variability was not associated with these early fires. Since 1960 widespread fire years were drier than normal. Canary Island pine could be useful for forestry in fire-prone environments because of its fire tolerance and sprouting capacity.

Molina-Terren, D. M. and others. [Forest Ecology and Management 382:184-192 2016]

Forest defaunation and recruitment in Gabon

Hunting in tropical forests can alter tree recruitment. A study in Gabon found that rodents caused the greatest seed mortality of eight commercial timber species. In heavily defaunated forests with the lowest abundance of larger mammals seedling establishment was only 42% of that with intact fauna. Declines in timber recruitment may convert to non-forest land uses.

Rosin, C. and others. Hunting-induced defaunation drives increased seed predation and decreased seedling establishment of commercially important tree species in an Afrotropical forest. [Forest Ecology and Management 382:206-213 2016].

Forests and growth in India

Mean basal area in rain forests was 43 m2/ha. 30-35 m2/ha in moist deciduous forests and 13 m2/ha in dry deciduous forests. Basal area increment per year in rain forests averaged 5.3% for pioneer species, 3.2% for canopy species, 2.0% for middle-story species, and 1.9% for understory species.

Rai, S. N. Basal area and diameter increment in Long Term Research sites in tropical forests of India [Indian Forester 142(1):13-17 2016]

Other Publications.

Special Issue in *Forests:* Incentives and Constraints of Community and Smallholder Forestry

This Special Issue includes nine case study articles and an editorial. The papers draw on case studies from tropical Latin America, Africa, and Asia. They analyse community and smallholder efforts to achieve different forest related objectives and outcomes stemming from these efforts. They examine in-depth a number of relevant topics, such as the conditions shaping forest dependency, mechanisms through which rural livelihoods can be improved through forests, and implications for forest outcomes, when forests are targeted to support people's livelihoods, while also providing local and global environmental services. These concerns are of high relevance to debates exploring potential synergies and trade-offs between sustainable development and climate change.

The articles link together two strands of the debate on community forestry by examining both local communities' and smallholders' dependency on forests and the contribution of forests to development.

The articles of the special issues are accessible at:
http://www.mdpi.com/journal/forests/special_issues/community_smallholder
This Special Issue was produced by the International Union of Forest Research Organizations Special Project World Forests, Society and Environment IUFRO WFSE.

Adaptability and Productivity of Hybrid Poplars in a Semi-arid Climate

Samuel C. Allen, Michael K. O'Neill, Kevin A. Lombard, and Robert F. Heyduck

The consideration of whether to grow plantation trees in the semi-arid Southwest is complicated due to limited water resources and harsh growing conditions. One genus of interest is Populus, which is fast-growing, adaptable to different soil types, and able to produce a variety of short rotation woody crops (SRWCs) under limited drip irrigation. To explore this potential, NMSU Agricultural Center at Farmington began research on water use of *Populus canadensis* (a *P. deltoides x P. nigra* cross) in 2007 with a trial aimed at monitoring growth of this species under varying irrigation levels. Four clones (entries 433, 544, 910 and 911) were planted as cuttings in April 2007 on 2.75 ha at 3.7-m spacing (770 stems ha-1) and irrigated at 70, 80, 120 and 130% of crop evapotranspiration (ETc) (later adjusted to 80, 100, 120 and 140% of ETc in 2013). Overall, clones 433 and 544 performed best in terms of growth and health. As of late 2015, entry 544 led for height (20.3 m), surpassing entry 433 (clone OP-367) at 19.1 m. However, both clones were statistically similar and highest for DBH (mean of 24.1 cm), wood volume (mean of 254 m3 ha-1), and total aboveground biomass (mean of 169 Mg ha-1). While biomass production tended to increase with higher irrigation levels, results varied by clone, year and other factors. Hybrid poplar seems to be adaptable to a semi-arid climate, with appropriate germplasm selection, site management and irrigation.

Contact: Samuel Allen, NMSU, PO Box 1018, Farmington, NM 87499; samallen@nmsu.edu; 505-427-9169

Reference: Allen, S.C., O'Neill, M.K., Lombard, K.A., and Heyduck, R.F. 2016. Adaptability and productivity of hybrid poplars in a semi-arid climate. 61st Annual New Mexico Water Conference, New Mexico Water Resources Research Institute, Silver City, NM. Online at:
https://nmwaterconference.nmwrri.nmsu.edu/poster-abstract-guidelines/poster-abstracts/

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http://www.itto.int/market_information_service/

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http://www.iufro.org/publications/news/electronic-news/.

FAO InFO News
A newsletter from FAO Forestry

The Food and Agriculture Organization's Forestry newsletter is available at this link:

http://www.fao.org/forestry/infonews/en/

Unasylva

http://www.fao.org/forestry/unasylva/en/ - An FAO forestry publication going back to 1947.

Global Forest Information Service (GFIS)

https://www.gfis.net/gfis/en/en/ (also available in Spanish and French) Global Forest Information Service contains up-to-date information on news, events, publications and job vacancies (on the homepage) and lists other info resources such as databases, as part of the GFIS system.
