



THE NEXT HUNDRED ACRES

Matt Bright, the Earth Sangha's Tree Bank Coordinator, explains how we're restoring forest in Hispaniola's rough border region.

“So ... how is this going to help this forest?” I asked Gaspar. I was standing at the top of a newly deforested hillside, looking down the raw, red slope dotted with patches of sprouting crops. Where the hillside leveled out, a thin strip of secondary forest began; it followed a small stream twisting around the houses behind me. (The photo above shows Gaspar, our Tree Bank Project Director, standing on the slope.)

The scene looked remarkably like the kind of swidden-cycle agriculture that we're trying to move away from here. Swidden, or slash-and-burn, requires chopping down and burning forest to release the nutrients in the plants. The land is farmed until it is exhausted and then abandoned for another patch of freshly cut land somewhere else until the initial patch regenerates and is cut again. While this kind of agriculture can in theory be sustainable, the land here doesn't regenerate fast enough and the result is chronically exhausted soil and low crop yields.

Gaspar looked slightly exasperated at my question. He has a practiced ability to read the land here—both the forests and the farms—that I do not. “The trees here were invasive. It wasn't a forest.” As the Sangha's US volunteers know, restoring land to its natural state isn't just a waiting game—the land has to be managed back into a natural forest, or meadow, or whatever. Without that kind of management, it can just become invaded scrubland stuck in a kind of succession limbo. The same is true of the land here in the Dominican Republic.

Continued on the back page ...

Inside: Ecological Restoration in the Burbs.

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The Earth Sangha's Tree Bank Hispaniola program works along part of the Dominican Republic / Haiti border to improve small-holder farm incomes and restore native forest. The Tree Bank includes:

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WHERE DOES ECOLOGICAL RESTORATION FIT?

Rod Simmons, one of the Washington region's preeminent botanists, discusses the ethics of planting, conservation in the 'burbs, climate change, and the meaning of ecological restoration.



Rod Simmons is the Plant Ecologist for the City of Alexandria, a member of the Virginia Botanical Associates (a nonprofit scientific organization dedicated to the study of Virginia's flora), a board member of the Virginia Native Plant Society, and Botany Chair of the Maryland Native Plant Society. He is also a lifelong resident of northern Virginia—so it's not surprising that he has an encyclopedic command of the local flora. I interviewed Rod for the March 2010 issue of the *Acorn*. Recently, I spoke with him again. We talked about conservation in northern Virginia and conservation in general. We also discussed ecological restoration—both its promise and its limits. Excerpts from our exchange follow. (My comments are in Italics.) – *Chris Bright*

Many people like the idea of planting on public lands, as part of ecological restoration. It just seems intuitively like such a healthy thing to do—maybe both for the landscape and for the people themselves. And of course planting is a major part of our own work. But in your view, how useful is it? Where should planting fit in our conservation agenda?

I think the first item on that agenda should be distinguishing cultural areas from natural areas. A lot of projects don't live up to their potential because people don't make this basic distinction first. It may sound obvious in the abstract but you'd be surprised how confused things can get, especially in our region, which is so heavily developed. And there are so many different claims on the land around here.

So you start with this distinction, to give people a sense of where they are and how they should proceed. Because restoration should not be about creating gardens in natural areas. That's the last thing we should do! Gardening is fine in its own setting but horticulture and restoration are two very different things.

Okay, so let's say that we have an area that everybody agrees is supposed to be natural. But it's degraded in various ways. How do we create a solid conservation agenda for it?

Well obviously a lot of that will depend on factors that are specific to the site. For example, what's growing in the area now? Are there major problems with invasives? What's the soil type and if it's a riparian area, what's the condition of the stream, and so on.

But thinking more generally about conservation, there's a hierarchy of objectives here. And the top priority should always be preservation. That's our most important obligation. It's what we owe the land and it's what we owe future generations of people. So where we have an area that's still in really good shape, we have an obligation to protect it. That's first. We should preserve as much as we can of what's left.

And the second priority is stewardship: we need to learn to take care of these places. That's also just part of living up to our responsibilities. Now some of the things that are labeled as restoration actually come under this category of stewardship—for example, suppressing invasives that may be coming into a natural area.

And then finally the third priority is full-bore restoration. And that's the kind of thing you do on a site that's connected in some way to a natural area, but that's in really bad shape. And of course the main precept of ecological restoration is that it must be natural—or as close to natural as you can possibly get. We really have an obligation to get it right—there aren't any awards for just trying!

How do you know if you're getting it right?

Well, again, the first thing you need to do is to know the site. And not just the site itself, but the reasons that the site is the way it is. What kinds of disturbances are you dealing with and so on.

Let me give you an example of how all this could play out, and how complicated things can get. Look at Manassas Battlefield [a Civil War site in Prince William County, Virginia] and some of the areas around it. You have patches of forest out there and of course you have these huge, beautiful native grasslands that are maintained by mowing.

Suppose you're working on a site out there. You'd start by asking that big question I first mentioned: is this a natural landscape or is it cultural? And here you have a situation in which you'd probably have to say that it's both. The battlefield region is a natural setting in obvious ways, even though human beings have been living there for generations, and working on the land. Long before the Civil War, the forest was cut-over, and the whole area was farmed in one way or another. But there were basic natural processes that people didn't interrupt. They didn't permanently drop the water table; they didn't completely eliminate the native flora; they didn't introduce a huge number of invasive alien plants, and so on. So there was disturbance in the sense that people altered various natural processes, but there weren't radical

Photo: Deep roots in northern Virginia. Rod Simmons and friend, an ancient tulip tree (*Liriodendron tulipifera*) in Wilburdale Park in the Annandale section of Fairfax County, near the headwaters of Backlick Run. This tree is a Virginia co-champion: it's one of the state's largest known tulip trees. Photo by Dianne H. Simmons.

discontinuities, and so it remains natural in a meaningful way. But the Battlefield is obviously cultural too, because of what happened there during the Civil War and also because we're trying to maintain it roughly as it was then, so people can learn about that.

So this is a cultural area but it's a natural area too. And if you're working around it, there may be cultural aspects in your work—maintaining a hayfield, for example—but you also have an obligation to work in a way that gives those big natural processes as much free play as possible, and that doesn't inject all sorts of extraneous things in there. So for example, you would want to create more space for the wild, native plant populations, so they can do what they need to do. And you wouldn't want to create what amounts to a garden.

In this respect, restoration is a little like medicine. That famous first phrase in the Hippocratic Oath, "First, do no harm"—that should apply to us too. We don't want to give the patient five other issues by just trying to fix one problem.

That gets us back to planting. One of the things that we are constantly dealing with is cultivars on planting lists—even lists that are being used by professional land managers. Obviously this is something that we try to discourage, since our whole approach is just to work with native wild plants. That's our own way of "doing no harm"! Do you see the use of cultivars as a problem in the planting of natural settings?

I think it's one problem. I think that there are a lot of problems with some of those plant lists. But as far as cultivars specifically are concerned, this is something that we shouldn't even have to talk about. Restoration calls for putting only the appropriate material back into the site—getting as close as you can to what's natural. And obviously a cultivar of anything—that's not only not necessary; it's not natural, just by definition. Even if it's a selection, a clone of a naturally occurring form, like that 'Henry's Garnet' selection of Virginia sweetspire [*Itea virginica*], that doesn't mean that it's natural to plant a couple dozen of those things into some park. A single naturally occurring form is one thing, but dozens of genetically identical clones of it—that's something else. That's artificial.

You might ask, "what harm would that do?" But it's not so much a question of future harm—that can be very hard to know. Instead, I see it more as a kind of degradation in the present. Think of it as a carrying-capacity problem. There's only so much soil and water and light in any given area, and you've just allocated a portion of that to something that's not natural, so you've degraded the landscape. In effect, you've lost a little bit of that land.

You said that cultivars are one of the problems on planting lists. What are the others?

I think the biggest problems generally result from a kind of sloppiness—a failure to match the species to the site in a scientifically appropriate way. People list species that may be native to part of this region, but not to the part where they're going to plant. They want to take things that are native to the coastal plain, for example, and plant them out in the Triassic Basin [a region in western Fairfax County, Virginia]. Things like sweetgum [*Liquidambar styraciflua*] for example. That's a common tree in the coastal plain but it doesn't naturally occur in the Triassic Basin.

And then there are the out-of-habitat choices. So for example, if you have a site in the coastal plain, where sweetgum does naturally occur, but it's an upland site and sweetgum is listed anyway. Sweetgum is a lowland tree; it wouldn't naturally occur in an upland area. Things like that.

Again, I just think that we have to be very careful not to do additional damage with weird, inappropriate species choices. Maybe one of the most controversial examples has to do with the efforts to reestablish the American chestnut [*Castanea dentata*].

[During the first half of the 20th century, the American chestnut was suppressed over the entirety of its natural range by the chestnut blight, an alien fungal pathogen that is a natural disease of Asian chestnuts. Hybridizing projects have now produced American chestnuts with the Asian genes that confer blight resistance.]

I think that the people working on this are well-intentioned, but it's just naïve to think that this genetically modified tree is somehow going to turn back the clock and cause the oak-hickory forests of eastern North America to return to the way they were at the end of the 19th century, when the chestnut was a co-dominant tree.

Things have changed. The oaks and hickories, for example—they haven't just been waiting for the chestnut to come back! Some of them may now be more abundant than they were back then. So to get this new tree up to the level of the chestnut's former abundance, the thing would have to behave like an invasive species. It would have to operate like a weed. And that would just make a mess. Not every kind of damage is reversible. Sometimes you have to live with the consequences of what's been done.

“We don't want to give the patient five other issues by just trying to fix one problem.”

The chestnut is a really special case—not very many plants get that kind of attention! But I'm also wondering about the more common scenarios. We've seen some really bad species choices even in lists managed by people who in other respects have a sophisticated sense of their role. It's kind of puzzling. What do you think lies behind this tendency?

Well, for one thing, there's a kind of industrial pressure. The big nurseries and seed suppliers deal in very high volumes. And obviously they have an interest in pushing their customers to use the stuff that they can produce most efficiently. They make it very convenient to do that, and the land managers obviously appreciate the convenience. This kind of thing can look very cost-effective, but sometimes there's a big, hidden price tag. If you plant the wrong stuff, you may end up putting a very heavy footprint on the landscape.

It's true that a lot of these companies also sell good things, but that's not where they're making their money. So sales of the high-volume stuff end up supporting production of the good but low-volume stuff, and the result is a lot of confusion and badly compromised projects. You end up wondering what good any of this is going to do.

But of course there can be problems with funding. The good stuff can be expensive. And it may not always be possible to get the appropriate, local plants.

Well, that's where you guys come in. We're beginning to iron some of these problems out. Thanks to your nursery, we can often now get much of this ecological restoration material for northern Virginia.

Apart from that false convenience, there may also be a problem with the perception of time. People understand that it takes time for trees to grow, but they often seem to want instant results when it comes to the landscape as a whole. It's an odd sort of expectation.

Yes, instant gratification is definitely a big issue, and not just for the general public. Civic leaders, contractors, planners—the mentality almost always seems to be, let's get some metrics in place, and get a time-table organized. Let's install a landscape. But the degree to which you can put nature on a schedule is really pretty limited. People just assume that we must have technologies that can mold nature any way we want—herbicides, high-germination seed selections, improved soil management, and so forth. But the truth is that we can't always do that. We can't just make nature do whatever we want. And even if we could, it might not be a good idea to do it! Because there are a lot of things about nature that we just don't understand. But people don't want to hear that.

And I think that people often have a very limited sense of the real possibilities. They want the local park to be beautiful—they want it to look like something that they saw in a garden catalogue or in a brochure from the Nature Conservancy. But what I think they usually don't realize is that there may be some wonderful, fascinating native plants growing out there already. And we have a responsibility to take care of those things, so we need to be careful not to kill these landscapes by trying to make them look more like postcards.

Those assumptions about molding nature remind me of all the interest in engineering for climate change. This is a topic that is getting more and more attention, as it gets harder and harder to deny that the climate actually is changing. People have proposed all sorts of ecosystem tinkering to mitigate probable effects, and some of these ideas are pretty kooky. Giant mirrors to reflect sunlight, and massive dumping of iron dust in the oceans to stimulate phytoplankton productivity, and so forth. And of course our field has not escaped this kind of attention. What do you think about planting to anticipate climate change? Planting species from farther south and so on?

I think it's reckless and completely unwarranted. It really is a major assumption to say that increases in greenhouse gas concentrations are driving every local climate trend that we see. I'm not a climate-change denier by any means—but this kind of very simplistic approach could make matters much, much worse than they already are.

Take northern Virginia as an example. We can see that there is a general warming trend and there's good reason to link that to the accumulation of greenhouse gases, but it's also important to understand that this region has experienced long-term drought—catastrophic drought—many times before. And many of our soils are sandy, so

they dry out quickly even when there isn't a drought. But the native flora is adapted to all that. It's actually pretty tough. We're not dealing with hot-house orchids here. So this idea that we should just give up, and basically abandon the traditional objectives of ecological restoration—the respect for nature as something that people shouldn't entirely control—I just think that's completely uncalled for. And it's just crazy, in my view.

I'm not saying that we shouldn't do anything. I'm just saying that the things we need to engineer have to do with human infrastructure and human activities, and not with what's left of our natural landscapes. What about finding the political courage to begin to reduce carbon emissions? What happened to that idea? What about re-engineering development so it doesn't drop our water tables? What about not fragmenting our remaining natural areas to death? It's not like we're going to run out of constructive things to do.

You know, we've stressed these landscapes so badly already, by cutting them up, and messing with their hydrology, and releasing all sorts of alien pests into them—weeds, and alien insects, and pathogens—and now we're saying that the way to save them is to replace what's left of the native flora with things that might be more hardy in a warmer climate? This is just nuts. It's certainly not going to leave us with a world that I, personally, would want to live in. And do you think future generations are likely to thank us for that?

Climate change would be bad enough on its own, but when you add in some of these other enormous environmental problems, like invasive alien species, and habitat fragmentation, and predator loss, and certain types of pollution—the picture does get to look pretty overwhelming. Especially since these stresses interact with each other in various ways and that can exacerbate the damage. Given the enormity of the problems that we face, I sometimes wonder whether small-scale conservation or restoration is even worth pursuing. What do you think?

I think that small-scale action is definitely worthwhile, for a number of reasons. In the first place, I think that we have a moral obligation to act when we can. That's the principle of stewardship and good stewardship needs to be very focused, so it's usually a kind of small-scale activity.

And the big advantage of small-scale projects is that you can kind of franchise them. The local jurisdictions can only do so much on their own. In natural resources management, we're almost always operating on a shoestring, so we need to be smart about how we develop our projects. And if we can enable knowledgeable volunteers to undertake small-scale projects more or less on their own, with just a little regular guidance, then we can greatly expand the benefit to the land.

Small-scale is also great for innovation and discovery. You can learn things or test ideas at relatively low risk, and there's the possibility of scaling up once you have a better sense for what's worth doing.

And finally, I would just point out that, in a sense, the world is made up of small places. Maybe not all of the world—but a lot of it. Small places can matter enormously.



Photo: Diversity is in the details. Rod examines the distinctive, velvety pubescent leaves of a mockernut hickory (*Carya alba*), in Wilburdale Park in Annandale, Virginia. Photo by Dianne H. Simmons. To learn about the Sangha's work at Wilburdale, go to earthsangha.org/sp/sp.html.



A BOTANICAL ADVENTURE

One day last September, I was out collecting seed for our northern Virginia Wild Plant Nursery when I decided to check on one of my favorite sites in Fairfax County’s coastal plain. This site is home to some good-sized blackjack oak (*Quercus marilandica*), one of our less common native oaks, and I was hoping to get some acorns. Blackjack oak likes dry, low-nutrient soils, as on this site. And soils like that often host other less-common native plants, so I was also going to do a little prospecting. In places like that, I never quite know what I’m going to find.

I walked in for a look. Any acorns? A few. Some Virginia pine seedlings were coming up here and there, amidst the purple lovegrass and poverty oatgrass. Less encouraging were the sprigs of Chinese lespedeza, a nasty invasive. And then I saw the spot shown above—with all those little, purple-flowered plants happily blooming away. A *Liatris* species. Beyond that I wasn’t sure—but I was hoping for the identification that I was later able to confirm: this was a population of grass-leaved blazing star (*Liatris graminifolia*). I had been looking for this plant for years! It had been here all along, but I had never noticed it because I hadn’t seen this spot during its bloom period.

In our region, this plant is confined to the coastal plain. It is now very hard to find in the wild because it doesn’t do well where the soil has been disturbed—it’s easily suppressed by the invasives that profit from disturbance. It’s also difficult to distinguish from its cousin, the dense blazing star (*Liatris spicata*), a fairly common plant in the local piedmont. Dense blazing star does not occur naturally in the coastal plain of our region, but it is probably being planted there pretty frequently. Such plantings alter the natural patterns of distribution—and that’s a big “No” for ecological restoration.

I covered my discovery loosely with dead branches, to keep the deer off, and returned later to collect some seed. That’s how grass-leaved blazing star became one of about a dozen new species for our nursery accessions this fall—bringing our total to well beyond 220 species. Several local agencies hope to use the resulting plants in their restoration projects—and we’re hoping that we can supply them! Unfortunately, the site where I collected the seed is neither protected nor stable; we need to get some descendent plants into protected coastal-plain sites, where they would naturally occur.

Help keep the DC region home to plants like this blazing star. Make a donation, or volunteer with us, or both!

—Lisa Bright

EARTH SANGHA

BUDDHIST VALUES IN ACTION

The Earth Sangha is a nonprofit 501(c)(3) charity based in the Washington, DC, area and devoted to ecological restoration. We work in the spirit of Buddhist practice, but our members and volunteers come from a wide variety of religious and secular backgrounds.

Want to contact us or make a donation? You can support our work by becoming a member. Membership starts at \$35 per year. Donations are tax-deductible. You can mail us a check (made out to “Earth Sangha”) or donate on our website. We will send you a receipt and include you in our mailings. (If your name and address are correct on your check, there is no need to send us anything else.) **Contact us at: Earth Sangha, 10123 Commonwealth Blvd., Fairfax, VA 22032-2707 | (703) 764-4830 | earthsangha.org.** Complete program information is available on our website.

Want to volunteer or meditate with us? We work with volunteers at our Wild Plant Nursery and our field sites in northern Virginia. We meditate in the Del Ray section of Alexandria on Tuesday evenings. For more information see our website or call Lisa Bright at (703) 764-4830.

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Restore the forests.
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2009: Here's what Matt is talking about. Above, in 2009, Suna Martinez stands in her recently planted Tree Bank forest plot, which at the time also served as a household garden.

... continued from the front page

There are many hectares of temporarily abandoned farmland in our region, but almost none of it regrows as native forest. Instead, it descends into a sort of green purgatory, dominated by invasive plants that suppress forest succession and soil regeneration and that provide little in the way of habitat or sustenance to local fauna.

"This will become forest," Gaspar continued, "but it will take time, so, until then, we farm." The crops around the hillside are all staple crops. Lots of corn, some squash, a couple types of beans, and some half-dozen different root vegetables that I've eaten but can't name. And yet, when I looked closer, I noticed this field had some serious differences from a standard *parcela*. Amidst these staples were citrus trees—"some people sell these for export, but I'd rather drink the juice myself," Gaspar tells me—as well as plantains and some fruit trees that will eventually shade the groundlayer. Here and there, native trees, saved during the initial clearing, rose over the planting.

These canopy trees are what make this type of farming a breakthrough for our region. These species occur naturally in local forest; some of them will also yield fruits and nuts that can be eaten or sold. As they create a canopy, they will shade out the corn, yucca, squash, and beans below. When that happens, the farm will receive another planting.

Coffee and cacao trees will be planted into the understory to join the citrus and the plantains. Ground-cover crops will be replaced by mid-story fruit, such as passionfruit. The canopy will contain papaya (as an avowed papaya-hater I shudder at the thought and make a mental note to avoid visiting when they're in season). "What we are left with," Gaspar patiently tells me, "is a productive forest. An agroforestry *parcela*."

"The forest will be mostly native, but it will also make money," he continues. "Birds and other animals can live here too." The second wave of crops will make the planting a low-impact forest-orchard. Gaspar tells me that he will continue to harvest coffee and cacao but won't disturb the progress of succession. Eventually this area will be fully returned to native forest with only minimal cultivation in the midstory.

The idea of forests that are also farms isn't novel; in fact, it's the basis of our Rising Forests Coffee program. But what struck me here was the systemic change that this bit of land is undergoing. It started as invaded scrubland with poor soil; it was cut, burned, and planted



2012: Here's Suna standing in about the same spot this year, doing an interview for our forth-coming Tree Bank video. Her trees have shaded out the garden and the forest has begun to take shape!

in the usual way. But instead of being farmed to exhaustion, it is undergoing managed succession back to native forest, while being productive every step of the way. This method of agroforestry is a bit like slash-and-burn in reverse: you start with crappy land and you end up with forest.

As I looked down the hillside, I could see why this is an attractive proposition. The land here is steep, so steep that no one in the US would ever bother farming it. But farmers here are always short of arable land, and, as they frequently tell me, they have lots of bills to pay. Because of those pressures, they take a keen interest in figuring out how to profit from forests. Gaspar, always an agricultural innovator, used one of our low-interest Forest-Credit loans to finance this bit of agricultural innovation, and he will begin to see a return on his investment in only a few months, courtesy of the nine-month growing season.

The *socios* (members) of the local agricultural association, our Dominican partner organization, pay close attention to each other's farming. If Gaspar succeeds here, and I think he will, other farmers will take note and follow suit. And that will mark a turning point for the Tree Bank.

Up to now, the Tree Bank has been supplying various incentive-based packages for forest restoration and sustainable agriculture. (The programs are listed on the front of this newsletter; details are available at earthsangha.org.) The packages work—and have thus far saved some hundred acres of forest.

But Gaspar's new farm is a method of his own development that hasn't required any of our brainpower—such as it is—or even any capital beyond what we already supply. That's the turning point: the farmers are beginning to draw on the Tree Bank's resources to power their own innovation and know-how.

There's one other innovation here too: that's the way that all of you, as members of our Sangha, have supported the farmers. Most development projects don't have communities behind them—and especially not for the long haul! Our farmers know this, and they're very grateful. For example, with your support, we recently constructed an important crop storage and meeting facility; in gratitude, the farmers emblazoned the side of the building with "Earth Sangha." I'm not the only one who sees our work here as a community-to-community approach. As I walk back to Gaspar's motorcycle for the trip home he asks me, "How do your *socios* like our coffee?"

Our special thanks to the Shared Earth Foundation for supporting the Tree Bank.