

Leaf Litter

Restoring the Earth and Inspiring Ecological Stewardship

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Working Toward Sustainability

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*When we try to pick out anything by itself,
we find it hitched to everything else in the universe.*
John Muir (1838-1914)

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Why is Sustainability so Important Anyway?

In 2002, the World Summit on Sustainable Development in Johannesburg made significant commitments to improve the lives of people living in poverty and to reverse the continuing degradation of the global environment. These are lofty goals that I am sure we all can agree with. But what does it mean to you and me, living day to day in

one of the most prosperous countries in the world? We wanted to find out so we surveyed our readers on a host of questions related to sustainable development. See the results of our survey in the "You Said It" section, many of the responses may surprise you.

The terms "sustainability" and "sustainable development" have become buzzwords within the design community. So what does "sustainable development" mean? *Our Common Future*, [<http://www.amazon.co.uk/exec/obidos/ASIN/019282080X/202-6426412-4529466>] a publication produced by the World Commission on the Environment and Development in 1987, coined the now widely accepted definition as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs". While the definition has helped to give structure and meaning to the sustainable development movement, many are beginning to argue that is not enough to just sustain existing resources for future generations.

What we really need to be doing is to not only practice conservation, but to embrace and integrate restoration into our economic, social and political institutions. Humans depend on clean air, pure water, and healthy soils, along with forests, oceans, rivers, and pollination to sustain them. Yet, our current development patterns tend to compromise or ignore the natural capital that is so important for our long term future. Think of it this way. More than 20% of Atlanta's forest cover has been removed over the past few decades as urban development has crept over the landscape, resulting in increases of more than 4.4 billion cubic feet of stormwater runoff. It now will take at least 2.2 billion dollars worth of stormwater management facilities to contain this runoff. Imagine a landscape full of crater size storage basins (I call them salad bowls) pocketing the landscape between concrete arteries. In contrast, what if we built into every new project a regenerative process of restoring the hydrological cycle through reforestation, green roofs, living walls, and porous pavement? Further still, what if this regenerative process was systematically applied to existing sites as well. Imagine now a landscape full of broad canopy trees, the soothing sound of song birds and cool summer breezes, not to mention a landscape that has real sense of "place".

Regenerative development may be a better answer! We interviewed Bill Reed, a leader and pioneer in the field of sustainable development. Bill's view on sustainable development is rather intriguing and quite thought-provoking. Take a look and learn more about the benefits of regenerative development. We think this has much promise and are already incorporating many of these ideas on some Biohabitats current projects.

Finally, what can we do at home to practice sustainable development, or even regenerative design? Here are some of our reader's thoughts.

"People need to be directly connected to the environment (i.e. environmental education needs to be more prevalent in our schools) so that from a young age, generations of people are raised to value and respect the environment enough to make it a priority and elect political leaders that share the same values and follow through on policies to protect and conserve our resources."

"Government--federal, state and local--needs to lead by example--in spite of the upfront cost, and where necessary mandate that the private sector participate."

"Somehow we need to change the perception of ourselves as being DISCONNECTED from the rest of the inhabitants we share on this spinning planet."

Thanks for sharing your thoughts with us. Keep thinking globally and more importantly, ACT LOCALLY!

A Few Examples of Good Sustainability Efforts

The Crystal Waters EcoCentre

[<http://www.ecologicalsolutions.com.au/crystalwaters/businesses/ecocentre/index.html>] in Australia is operated by the Global Ecovillage Network Oceania & Asia Inc. and it is available for hire for courses, workshops, seminars and meetings.

The Philip Merrill Environmental Center is a microcosm of the Chesapeake Bay Foundation [<http://www.cbf.org>] and its efforts to reduce pollution, restore habitat, and replenish the watershed's fish stocks. It is also an offshoot of CBF's desire to put its Annapolis staff in a Bay-friendly work environment--one that enhances the creativity, productivity and teamwork that are hallmarks of CBF's work to Save the Bay. The Merrill Center demonstrates the benefits of a holistic, integrated approach to office building design and construction that minimizes impacts on the ecosystem and enhances job performance.

On **The Gap's Green Roof**..."We believe everyone has a part to play in protecting our environment. That's why we strive to promote environmental stewardship throughout our business — from setting expectations with external vendors, to daily business decisions affecting purchasing, merchandising, marketing, store construction and facility management," – Gap, Inc. Also visit The Gap's commitment to sustainability [http://www.gapinc.com/social_resp/enviro/buildings.htm] as it extends beyond its building design [<http://www.mcdonoughpartners.com/projects/gap/default.asp?projID=gap>].

You Said It

While Leaf Litter is meant to entertain and educate, it's also meant to survey and absorb. We rely on our own reading and peer conversations to generate the basic Leaf Litter content, but we rely equally as much on results from our industry-wide surveys.

In order to develop a meaningful issue of Leaf Litter dedicated to the vast matter of sustainability, we surveyed our readers and were surprised with some of the findings. For example, only **16%** of respondents were familiar with the term regenerative design. This prompted us to feature an interview with one of the preeminent voices on the subject, Bill Reed. A common misconception is that implementing sustainable

practices is too costly, at least that's what **37%** thought. Bill counters this notion in his interview and explains why sustainable practices can actually provide cost savings.

The links section of Leaf Litter might provide the necessary fodder for the **25%** who felt that there was no buy-in from upper management when it came to implementing ecologically sustainable practices and the **7%** who weren't even aware that such initiatives existed. There are more than **100** links in this issue that can direct you to educational degree programs, government initiatives, successful projects and more. And when you consider the links sections within many of these sites, you suddenly have thousands of sustainability-related web sites at your fingertips.

Congratulations to the whopping **91%** of respondents who implement sustainable initiatives at home! Most recycle (cans, glass, paper), but those taking it an extra step are landscaping with native plants, collecting and reusing rainwater, composting kitchen/yard waste, biking to work, conserving electricity, growing their food, purchasing energy-efficient appliances and vehicles, carpooling, buying locally and – here's a novel idea – walking whenever possible!

There are several key organizations out there leading the charge in an effort to make our world more sustainable and, surprisingly, many respondents weren't familiar with them. Take a look at the list below to see how well known these groups were among Leaf Litter readers, click on the name for more information:

▶ U.S. EPA Pollution Prevention Program	58%
http://www.epa.gov/p2/	
▶ Green Building Coalition	33%
http://www.mit.edu/people/jatlee/GBTC/Help.htm	
▶ U.S. Green Building Council	33%
http://www.usgbc.org/	
▶ Leadership in Energy and Environmental Design (LEED)	29%
http://www.usgbc.org/leed/leed_main.asp	
▶ Coalition for Environmentally Responsible Economies (CERES)	17%
http://www.ceres.org/	
▶ The Natural Step	10%
http://www.naturalstep.org/	
▶ Coalition for the Environment	8%
http://www.saveoureenvironment.org/	
▶ Renewable Energy and Policy Project (REPP)	6%
http://solstice.crest.org/	
▶ GreenGuard	4%
http://www.greenguard.org/default.asp	
▶ Talloires Principles	3%
http://www.ulsf.org/pdf/TD_resourcekit.pdf	
▶ Earth Pledge Foundation	2%
http://www.earthpledge.org/	

What was very encouraging about the survey is that **80%** of respondents are implementing or pursuing landscape ecology and/or biodiversity through their work; **71%** are doing the same through green infrastructure and green architecture and **70%** through attention to resource consumption. Interestingly **42%** feel that degradation of air and water quality will most benefit from focused sustainable practices like those indicated above. **29%** think that the consumption of non-renewable resources could most benefit; and, taking up third place, **14%** believe their efforts could most affect the loss of biodiversity.

Clearly, at least among our audience, we are becoming a more educated and concerned society. Through implementing these efforts **63%** believe it's making a difference in terms of public relations (communicating with peers, clients, prospects and employees); **60%** feel they are conserving biological diversity and **39%** believe they are saving money. Only a pessimistic **3%** feel their efforts aren't making any discernable difference.

We asked an open-ended question about what needed to be changed to bring sustainable design concepts into mainstream thinking. Here is a sampling from the almost **200** responses:

- It's not just something for hippies or earth freaks.
- The need to all have our own car to feel independent, and our own big, green lawn to have privacy.
- Energy efficiency is more cost-effective in the long-term.
- It begins with educating our children.
- EVERYBODY can do this and [receive] benefit, not just a few elitist environmentalists.
- That we are stewards of the earth's resources, not rulers over them.
- That our individual and collective consumption is totally unsustainable.
- We are part of nature, not apart from it.
- Environmental issues need to have more local relevance.
- The public must understand that small changes implemented by thousands of people lead to large impacts.
- Building codes need to include sustainable design concepts directly, not as code variances.
- Government (federal, state and local) needs to lead by example.

Thanks to all who responded! Look out for our next survey, it will hit your mailboxes in late January.

Green Design Expert Bill Reed Speaks to Leaf Litter

Bill Reed has been a practicing architect for 20 years and is one of the nation's leading experts on green design. He approaches regenerative design as the framework for which all technical and functional decisions are derived; the ultimate goal being the improvement in the overall quality of the physical, social and spiritual life of our living places. Bill currently works at Natural Logic [www.natlogic.com] where he is vice president of integrative design. He focuses exclusively on green building and community planning issues. Visit the Natural Logic website for Bill's full resume.

Leaf Litter recently sat down with Bill for an exclusive discussion about sustainability and regenerative design; he provided definitions of environmentally responsible design terms for your reference.

High Performance Design	Design that realizes high efficiency and reduced impact in the building structure, operations and site activities. This term can imply a more technical efficiency approach to design and may limit an embrace of the larger natural system benefits.
Green Design	A general term implying a direction of improvement in design (i.e., continual improvement towards a whole and healthy integration of human activities with natural systems).
Ecological Design	Design that take into account the interrelationship of all organisms.
Sustainable Design	See "Green Design" with an emphasis on reaching a point of being able to sustain the health of the planet's organisms and systems over time.
Whole System Design	This is a term that acknowledges that all human and natural sub-systems are interconnected and how they can relate as a whole.
Restorative Design	This approach thinks about design in terms of using the activities of design and building to restore the capability of local natural systems to a position of self organization and continual evolution.
Regenerative Design	This is a design process that acknowledges that humans are an integral part of nature and that human and natural systems – currently disparate systems in western culture – need to be in alignment in order to achieve a state of continual and healthy evolution.
Elegant Design	Achieving the desired objective using the least amount of resources.

BIOHABITATS

What's the difference between sustainability & regenerative design?

BILL REED

It's probably important to start with what the word "sustaining" means. I believe "sustainability" is a useful term, it's very motivating to me, but as we know from one study done by the President's Council on Sustainable Development

[<http://clinton2.nara.gov/PCSD/>], most people have no idea what the word means.

Sustainability is seen as neutral and not necessarily motivating. Most people think, "We've got it pretty good now; I'm happy to sustain what we have." The word is not capable of bringing a new level of understanding - that we are connected to a complex interrelationship of systems that support our lives and we are not sustaining this base of support.

The emphasis is on reaching a point of being able to sustain the health of the planet's organisms and systems over time. That sounds pretty good to me; it

motivates me. Unfortunately the term has been made dumb (unable to communicate) because few, if any, people know how to get their hands around something so complex. So we have countries calling hydro dam projects "sustainable projects" because they're sustaining an economy. Or we have LEED

[http://www.usgbc.org/LEED/LEED_main.asp] being called sustainable design when we know it's basically an entry level effort, the training wheels, to launch us into deeper level of thinking about this stuff.

LEED is primarily a transformation mechanism; it's not close to a final definition of green design. So where are we headed? **The definition I'd like to see for green design is "activities and practices that support and improve the health of the systems that sustain life."** If we accept that current planetary systems are

degraded, then we need to adopt a new role: participation in improving them. Note that I didn't say we could do this on our own - participation means acknowledging our partnership with natural systems.

It's time for us to move to the level of restorative or regenerative design. The two words have a distinction that is subtle but important. First, lay people understand restoration to mean restoring a system or a place to its original state. That is not what ecological restoration is about. The distinction is the premise that we can restore a natural system to a stasis, when in fact, natural systems continually evolve. This is something we have to understand: nature just isn't a thing, or a state, but it's a complex relationship of evolutionary processes. So really what we mean when we talk about restoration is restoring the capability of natural systems and place to continue to evolve.

Another other aspect of restoration from a layman's point of view is to understand that humans have been inextricably engaged with natural systems for millennia. We have to ask the question, not only "how does the system want to evolve" or "what are the numbers of ways it can evolve" but "how will humans participate in that system in

such a way that they are aligned and supportive of that evolution?" This is where we begin to make a distinction between restorative design and regenerative design.



BIOHABITATS

At what point do you break the cycle to make the change?

BILL REED

There is no point. **Evolution is continuous.** We have to decide what level of health we want to have in our society. We have to look in the mirror and decide if we want to be around for a few more millennia.



BIOHABITATS

I guess, one must also ask at what scale are you willing to work at this?

BILL REED

That's one of the fundamental questions. **The most important aspect of this work is to get people to ask questions** so they can answer the questions themselves or with some guidance. We can't tell people what they have to do. People have to want to engage in their systems in a healthy way and understand the ramifications of decisions.

Right now, if you look at the triple bottom line – equity, economy and environment – the economic question is overwhelmingly dominant. The first question clients ask is always, "what does it cost?" So obviously we have a perverted sense of value. That has to change. People must recognize that our fundamental life support system is not shopping (as the President has indicated). The question is ultimately whether we value the systems that truly allow our lives and our children's lives to be sustained.

It's really pretty simple. Let's get rid of all the jargon. **We've got to have clean air and clean water to support healthy soil to grow food for all species. That's it. That's what sustainability's about.** And if we're breaking the cycles of health that produce the healthy soil and food stuffs (food for all types of organisms), we've not achieved any level of sustainability. Since we are breaking these cycles, we have to begin a process of regeneration if we are going to meet the objective of feeding the world's population.

Many environmental scientists say that we have to achieve a 90% reduction of resource use by 2050 in order to equitably feed and support the world's population (a Factor 10 society [<http://www.techfak.uni-bielefeld.de/~walter/f10/declaration94.html>]). We aren't going to do it with LEED alone. We aren't going to do it with restoration projects here and there; although that's part of it. We have to restore with a higher level of understanding and participation – by aligning our activities with natural systems. This can be summarized with these two principles; 1) natural systems have a self organizing

capability to heal themselves; if we let them, and 2) we are nature. These are alien concepts to Western Society.

If we can get over the fact that we're not separate from nature, that we have a right to be here and we also have a responsibility not to screw it up, that we then can start engaging more than just – and here's where I want to make a distinction between what the Biomimicry people are saying – using nature as a model. That is, to me, missing the last step, because as long as we continue talking about using nature as a model, we have separated ourselves from it. Instead **we need to learn to participate with nature.**



BIOHABITATS

You work with a lot of mainstream organizations, what do you find is their impetus to wanting to become more 'green' and are you finding that that impetus is changing?

BILL REED

Sure, it's definitely changing. Thirteen years ago green design was minus 10% of my income. Now it is 130% of the work, we can't keep up with the demand for LEED-related project consulting. I've been talking about the subject of regeneration for four years now and in the beginning it was just talk. Now we're getting calls from people who want to hire us to do this work. This aspect of the business is now 10% of our income.

A gigantic corporation is doing a new headquarters and they asked us to come down and talk with them. They'd heard about the concept and asked, "What does it mean?" Now, I don't know if they'll find the ability to exercise this kind of change, but at least they're asking the questions. And that's the first step. **People don't learn until they're willing to ask the question**, so I think raising the discussion is the first indication of change.



BIOHABITATS

The bottom line of cost affects many people and if they can see that there's a benefit, than that's the way they'll go.

BILL REED

And if you think about it, there's no reason there wouldn't be a benefit. This whole reaction that our government has to environmental stuff is misplaced. They think it's expensive. In fact we are going to be in worse shape if we don't do this. We'll be way behind the learning curve of other nations...when you save resources; it's going to ultimately save you money.



BIOHABITATS

Are there particular areas, geographic regions within the U.S. and the world who are leading the effort?

BILL REED

The Dutch, from my limited perspective, are the best.



BIOHABITATS

According to a recent Leaf Litter survey, (18) 55% of the respondents said that cost was the biggest prohibiting factor to implementing sustainable design practices.

BILL REED

No, **the biggest limiting factor is "will."** The people who have the will find out it doesn't cost more. I can tell you that of the projects I've worked on in the last 6-7 years, maybe 3% were successful in achieving their stated objectives without falling off the wagon. The common element for those projects was that the clients and design team had the will to fight the seeming barriers. They found that there were not significant barriers at all. It simply meant they had to think a little harder and differently.

I don't like subsidies and grants because this work can be done at nearly cost – with much lower life cycle costs in the offing - if you have the will to optimize systems (i.e., don't treat green as an add-on to our existing design framework). **If people think we need subsidies to do it, then they're missing the point.** Nevertheless, I accept the role of subsidies to give people the greater capability to ask more questions. Subsidies, if they are utilized to transform the market, should have a sunset clause so that the weakness of the solar industry in the 1970's will not be repeated.



BIOHABITATS

Is there an example of a particular community or organization which has incorporated these environmentally responsible design themes into their existence?

BILL REED

Crystal Waters

[<http://www.ecologicalsolutions.com.au/crystalwaters/businesses/ecocentre/index.html>] in Australia is one of the most well known of these communities. They essentially looked at closing the nutrient cycle. Go to the Global Ecovillage Network [<http://www.ecovillages.org/>] to find more communities that have taken the idea of nutrient flow back home.

I see from the same Leaf Litter survey that 74% of respondents said consumption of nonrenewable resources was the most compelling environmental problem. I have a

different perspective. I think it's the least of our problems. Stuff doesn't disappear. The high percentage is probably the result of a lot of architects filling out the survey – materials are our palette. **Our real problems are in the realm of the invisible** – the connections between the elements and stuff of our lives.

Steel companies are mining the dumps now for most of the steel in the United States. As the law of conservation of mass and energy indicates, stuff just doesn't disappear. What does disappear is the capability for life to remain viable and maintain the ability to participate in evolutionary progress. It's the diversity, redundancy, resilience of plant and animal habitat that are disappearing. It's all connected, so it's hard to isolate.

Nigel Howard (VP of the USGBC) has an example, "if you took all the buildings in England, Scotland and Wales, ground them up to a powder and distributed the result equally over the big island of Great Britain they'd cover it to a depth of approximately two centimeters." If it wasn't for the toxins in the materials, you could call them a soil additive and till them under. No big deal. The problem is compounded when we disrupt life by using persistent bio-accumulative toxins in our materials and alter the flow and relationship of natural systems. **If we limit the health of water and air, we affect the ability of life to replicate in a healthy way**, which then limits the health of soil which destroys the ability to create food.

I'd say that potable water and global climate change are *the* two biggest problems facing us.



BIOHABITATS

One of the things we're trying to do with Leaf Litter is to include helpful information that our readers can take home. If you were talking to someone on an individual level, can you give 1-3 initiatives that anyone can implement?

BILL REED

Pretty simple. When it comes down to it, all sustainability is local. So, two initiatives are to limit consumption – and consumption is really the driver of what's ruining the natural systems – and buy and live locally, or trade and live locally. Those things aren't hard to do. **Live without excess** and don't go to WalMart.



BIOHABITATS

When it comes back to the will, you need to be able to take the extra minute to find out where you can buy local produce.

BILL REED

That's right and there are a lot of people doing it. Support the cooperative movement [<http://www.coopdirectory.org/>].



BIOHABITATS

Can you talk about your greatest professional success?

BILL REED

Well, that's tough. What I'm talking about has no ending. There's no finality. But let me give you a recent example of a project. I gave a talk about a year ago to a cooperative grocery store that wanted to build a green grocery store. I talked with them about the idea of regeneration and they felt it important but wondered what it meant practically? We conceptually walked through the grocery store and discussed where their food items came from. They were buying strawberries from Chile, apples from New Zealand, tofu from Burma. It was pointed out to them, and this is conservative, that **the average bite of food in the United States travels 2,000 miles per forkful**. Michael Pollan, author of Botany of Desire [<http://www.amazon.com/exec/obidos/tg/detail/-/0375760393/104-9905131-8321550?v=glance>], has a quote, "the strawberry has five food calories of energy and requires 435 fossil fuel calories to be shipped from California to New England." Janine Benyus, in her book Biomimicry [http://www.amazon.com/exec/obidos/ASIN/0060533226/qid=1072204501/sr=2-1/ref=sr_2_1/104-1912048-6562318] talks about the work of Wes Jackson – how for every bushel of corn taken out of Iowa, we lose a bushel and a half of top soil partly as a result of monoculture farming. The large systems of economic efficiency are slowly strangling the resources of the planet. Nature doesn't work the way industrial society thinks it should. It goes back to buying and living locally.

Look at how we fed ourselves before the Industrial Revolution - within a 20 mile radius of our cities. After the Industrial Revolution we went on a rampage of nutrient extraction all over the world, and we've been shipping nutrients over incredible distances, at great environmental cost ever since. To simplify that, Paris is an example I use because they had the first modern sewage system. Paris fed itself within a 20 mile radius, so the food that went into mouths was eliminated and carried right back to the fields. The fields were continually replenished -- it was a closed loop cycle, right? After the sewage system was built in the 1850s, the food went in one's mouth and was eliminated down the Seine into the English Channel. That's been replicated in every city in modern times. The nutrient cycle was totally broken, to the point now where we're shipping food and petro-chemical fertilizers incredible distances. So, what's more important to the sustainable mission of the grocery store? To save 30% of the energy use of the building or to shift the nature of nutrient flows?



BIOHABITATS

Back to the bottom line issue, does that cost them more money initially?

BILL REED

It might, but there is the long term benefit. If it might cost you a few pennies more, you're not going to change immediately, but what you are doing is by

bringing nutrient cycles closer to home, you're creating an economy that is based on multiple sources of inputs and outputs that are continually closed looped.

Instead of depending on getting jobs in, let's take a BMW plant. Let's say the plant in South Carolina is enticed to leave because of a tax break in New York. So they shift all the jobs to New York. Where does that leave the city in SC? Bereft of jobs; it's a win-loose situation. One group will be gaining while the other will be hurting. It's a boom-bust cycle.

Since European conquest in North America many communities have been going through 30 to 100 year cycles of nutrient extraction and then economic bust. Another example of nutrient extraction is in Vermont. First it was tree harvesting, then it was sheep farming, then it was burning of trees to make potash, then it was farming practices and grazing practices to the point where the state has never had a chance to recover its basis of rich nutrients. They've been shipped elsewhere. That's what our economic system has done to us, created a bunch of monocultures that are theoretically harvesting nutrients in a very productive way and sending them out elsewhere - trading back and forth. **The energy and resource expenditure required to trade back and forth is part of what's damaging the environment**, not to mention the monocultures that more "efficiently" produce the feedstock for other places.

Experimental farming and permaculture practices have learned that agriforestry [<http://www.unl.edu/nac/>], (also known as agroforestry), mixing complex plant crops, are more productive than monocultures and don't require the nutrient additions.

So what do we continue to do in the mid-west? We have crops monocultures, nutrients are extracted, and the soil becomes poorer. Then we need to replenish it. We don't put our own excrement and urine back out there, we use fossil fuels that don't return the minerals our bodies need. The soil is now not able to serve its original purpose. So, you see how screwed up the system is? **If we start taking ownership of the nutrient cycle closer to home we'll likely have healthier food** because we'll know the source from which it came. We'll have communities that will be less likely to be held hostage by single point disruptions like trucker's strikes, oil prices spiking or a company moving out of town. We'll spend less money on shipping, sustain jobs, and reduce costs for energy and waste disposal. What's not to like? It's just a change from what we've been used to the last 150 years. The current state of nutrient flow will not allow us to address long-term solutions to health and economic sustainability.



BIOHABITATS

So would you consider that to be one of the most vexing issues about regenerative design?

BILL REED

I'd say that's one of the most promising opportunities, to help people realize they don't have to be subject to the whims of the global economy that they have no control

over. Please understand, I am not taking a knee jerk anti-globalization stance. **I believe that the excess goods in a community can be traded.** The concern I have is that we cannot afford to keep shipping stuff all over the planet at the inevitable cost and damage to poorer nations. Something has to give.



BIOHABITATS

Part of what seems frustrating to me is that there are a couple of great local food stores that do this in Baltimore, but how do you get the Giants, Star Markets and SuperFresh's of the world to do the same?

BILL REED

You don't. **You have to vote with your feet.** I mean, that's what food Co-ops [<http://www.organicconsumers.org/foodcoops.htm>] out there are trying to do, but it's interesting how they have not evolved. Originally they had a market carved out that focused on organic and locally grown foods. Now Whole Foods [<http://www.wholefoods.com/>] comes in and says that they're going to provide local products, but their management is much more refined and they can out-compete the Co-ops. So the Co-ops need to raise the bar on their mission – perhaps moving to local economy issues and long term sustainability. The large corporations can't compete with that.

Regeneration requires one to acknowledge the way the system has worked in a watershed or region; what are the healthy ways it's worked in the past and how does one align human activity so that health continues? It may not be the same kind of ecology that existed there before, but different ecologies exist in different places in healthy ways. Central Arizona was a high, dry grassland prairie until the cattle were brought in. Now it's a different ecology. Is one worse than the other? I don't know. I'd be inclined to think that white man screwed it up by introducing cattle, but we might be able to begin a regenerative process by removing the cattle, replanting and supporting flora that will begin to allow the soil to function in that original sponge-like character. Human development – done in a way that supports the regeneration of the prairie system - may be the only way we can afford to engage this place in a healthy way, in a way that heals.

That's the hard thing for us to understand...**humans can actually become healers in concert with development.** If development is done with the understanding that we have to manage the soil properly, that it's built into the design of the community and that people aren't allowed to plant turf grass, for instance, than there's a chance for humans to begin to participate in catalyzing healing.



BIOHABITATS

There's such a tremendous amount of educating that needs to go on.

BILL REED

Oh yeah, it's absolutely part of it. But what I'm seeing after talking about it for four years is that lots of **people want to be educated**. That's the victory, people are asking questions now and when they're asking questions, they're willing to learn.



BIOHABITATS

It needs to be a holistic change.

BILL REED

That's right. It's a systems issue with humans acknowledging we're an integral participant and have an **obligation** to engage in that system.



BIOHABITATS

I found in our language that no one word takes into account human's relationship with nature.

BILL REED

That's one of the points I make in my talks. If you look in western society you have to talk about co-evolution. That's as close as we get. Basically we have to say "humans" and "natural systems." Daniel Botkin, in Discordant Harmonies [http://www.amazon.com/exec/obidos/ASIN/0195074696/qid=1072204915/sr=2-1/ref=sr_2_1/104-1912048-6562318], talks about the three different views of nature we hold in our society: the divine, the machine, and the organic. I simplify it by saying the right wing view is that we can do anything we want with nature because God gave it to us. The left wing view is that nature is so good and we're so bad that we can't touch it, that's why we create parks – fenced nature. Both are absurd. We need to understand we're a very dominate part of it, so let's act responsibly and start understanding the impact we have on those systems. And to do that requires us to **look much more deeply at the connections of what we do**. That's what our government isn't doing, and what most of us don't do. We look one level deep, but we have to go four, five or six levels down. It's not that hard, just different.



BIOHABITATS

Should government's role change or should change come from the grassroots up?

BILL REED

Obviously it needs to happen from both or it'll never be law. But right now we have ideologues that think life is all about individual freedom. I think they miss the way this country was founded – individual freedom with responsibility. But what individual freedom says from that perspective is that you have the right to drive an SUV, or do anything else you want with your piece of land. We no longer have that capacity for

making mistakes anymore. We've migrated to the Pacific and can't go any further. Listening and responding to the feedback from the natural and social systems that make our planet thrive is the most important frame of mind we can bring to this situation. We no longer have the luxury of raping a piece of land and moving on. **It isn't the other guy's job; it's all of our responsibility.**

If we choose to drive an SUV, is it for a good reason or do we do it without thinking? Right now the environmental laws are being dismantled. The perspective that's missing is the real role of government to help us function as a community. The government we have now is more obviously special-interest oriented than ever before. As Rousseau said (and I paraphrase), "the rise of special interests will be the death of democracy."



BIOHABITATS

When you talk about aligning humans with place and how in regenerative design you have to understand that humans are an integral part of the natural systems; in your mind does that mean you have to accept human flaws?

BILL REED

Sure. Natural systems have flaws too. **The whole system is continually in dynamic equilibrium.** There are droughts and forest fires and floods and deep freezes. But with redundancy and complex systems there are always ways for them to recover. The monoculture system doesn't work that way. We've isolated our world in groupings of monocultures, so when I talk about alignment, I mean a two-pronged approach is required, 1) understand the way systems work in your region and watershed and 2) get people, through organizational development techniques, to begin to understand that those actual systems have certain ways they're supposed to work and how we can work with them.

The second part is done by looking for the aspirations of those people engaged in that system. Aspirations, not visions. A vision, in the way we improperly use the term today, could state the need for a new highway. Another vision might come from someone who doesn't want a new highway. What's a politician to do with that? But if you look at the aspirations of why one fellow wants a highway and the other doesn't – it comes down to the aspiration that one guy wants a new highway so he can get his work done faster and spend more time with his family. The guy who doesn't want the highway wants it for his children, too. **Understanding aspirations allows people to move from struggling over what exists to having a stake in what can be evolved.** This allows us to begin to redesign our relationship to that place.



BIOHABITATS

Is there anything I didn't ask?

BILL REED

A lot of people talk about how depressing this all is. I guess I take a perverse view that we're already in collapse. I'm motivated into action by that. At least for me, it's been an incredible discovery and a spiritual gift that we can have this kind of relationship with creation. **What's given me hope is how quickly I've seen natural systems recover when they're given the chance.**

Bringing Sustainability to a University Master Plan Case Study: University of Maryland, College Park

Colleges and universities across the country are exhibiting a new sense of environmental stewardship and commitment in their master planning efforts by including significant ecological considerations when planning for campus extensions, building renovations and new construction. The University of Maryland has become a nationally recognized leader for the breadth of the environmental issues tackled in their recent 20-year master planning efforts. In fact, the school was honored with the Greening Award from the National Wildlife Federation in April, 2003 for its plan.

The master plan said it best..."In recognition of the university's special responsibility as the leading public research institution in a region noted for Smart Growth, the committee imagined a campus of coherent design based on four broad principles or goals, [one of which is to]... Create a campus that respects the natural environment, practices environmental stewardship and sustainability, and emphasizes harmony between natural and man-made landscapes."

In Fall 2000, President Mote appointed a Facilities Master Plan Steering Committee, charged with developing a plan that defines the principles and lays the foundation for the orderly development and growth of the campus over the next twenty years. The plan addresses current campus needs and goals while being sufficiently flexible to respond to future changes while envisioning a campus that both teaches and exemplifies concern for the natural environment. Led by the nationally-known campus and architecture planning firm of Ayers/Saint/Gross [<http://www.asg-architects.com/>], the campus master planning team included Biohabitats and Martin/Alexiou/Bryson [<http://www.mabtrans.com/>], a transportation planning and traffic engineering firm.

Working closely with the planning team, Biohabitats conducted the first ever ecological assessment and inventory of the College Park campus, examining a host of issues including urban landscape ecology, hydrological cycle, vegetation communities, invasive species, water quality, biodiversity, landscape habitat

quality, green infrastructure, energy conservation, non-renewable consumption, and waste management. From the inventory it became increasingly clear that the ecological attributes of the campus have not only dictated its historical development but also are primarily responsible for its 'sense of place.' Due largely in part to Biohabitats efforts, the Board of Regents did something that has never been done before in past campus master planning efforts at the University. Recognizing the importance ecology plays in the long term sustainability of the campus, the Board directed the master planning team to base the future build-out of the campus first and foremost on the ecological attributes of the campus. For additional information on the master plan see <http://www.facilities.umd.edu/masterplan/>.

Here are some web sites that might prove useful for sustainability master planning endeavors:

Phase II Post-Construction Runoff Control Fact Sheet

This fact sheet outlines the Phase II final Rule requirements and profiles the Post Construction Runoff Control minimum control measure by offering some general guidance. [<http://www.epa.gov/npdes/pubs/fact2-7.pdf>]

Standard Urban Storm Water Mitigation Plan

Los Angeles County SUSMP is a model guidance document for selecting post-construction BMPs. Also features model storm water management programs. [<http://www.ladpw.org/wmd/NPDES/>]

Low Impact Development in Stormwater Strategies

Natural Resources Defense Council LID principles, programmatic considerations, design strategies, and an example of an analytic procedure for designing runoff treatment systems. [<http://www.nrdc.org/water/pollution/storm/chap12.asp>]

Low Impact Development Center, Inc.

Information on LID BMPs and case studies; links to related organizations. [<http://www.lowimpactdevelopment.org/>]

Low Impact Development Literature Review and Fact Sheets

U.S. Environmental Protection Agency and LID Center. Overview of LID principles and issues such as use, ownership, and cost. Summarizes information on pollutant removal effectiveness of LID practices. [<http://www.epa.gov/owow/nps/lid/lidlit.html>]

Low Impact Development Design Strategies

Prince Georges County, MD Comprehensive manual describes how LID can achieve stormwater control and preserve natural hydrology. [<http://www.epa.gov/owow/nps/lidnatl.pdf>]

Growing Greener in Your Rappahannock River Watershed

Friends of Rappahannock, Watershed planning with "green development" practices boasting economic and environmental benefits. Contains BMP cost information and case studies. [<http://www.nps.gov/ncrc/portals/rivers/projpg/watershed.htm>]

Maintaining Urban Stormwater Facilities: A Guidebook for Common Ownership Communities

Montgomery County (MD) Maintenance information for ponds, infiltration trenches, underground storage structures and oil/grit separators. [<http://www.montgomerycountymd.gov/>]

Sustainability and Green Buildings

Pacific Northwest Pollution Prevention Resource Center Newsletter provides information on green/sustainable buildings, plus green building resource list.
[<http://www.pprc.org/pprc/pubs/newslets/news0799.html>]

Sustainable Building Sourcebook

Green Building program of the City of Austin Sustainable building practices including pervious materials, and using rainwater for irrigation.
[<http://www.greenbuilder.com/sourcebook/contents.html>]

T.R.E.E.S. Project

Trans Agency Resources for Environmental and Ecological Sustainability. Design for retrofit of LA as a living watershed. BMPs for industrial sites, commercial buildings, schools, apartments and single-family homes.
[<http://www.treepeople.org/trees/>]

Countywide Drainage Area Management Plan

Orange County Stormwater Program (CA) Small-scale development source pollutant prevention and treatment measures, for new development or redevelopment. [http://www.ocwatersheds.com/StormWater/swp_documents_damp.asp]

Play the Great Green Web Game!

[<http://www.ucsusa.org/game/game.html>]

Sustainability Links

General Sustainability Information

Eco-search of projects world-wide

<http://eco-index.org/search/index.cfm>

Institute for Social, Economic, and Ecological Sustainability

<http://www.fw.umn.edu/isees/>

Virtual Library on Sustainability

<http://www.ulb.ac.be/ceese/meta/sustvl.html>

Joint Center for Sustainable Communities

<http://www.usmayors.org/USCM/sustainable/>

A Gateway of the Movement for Environmental Sustainability

<http://www.eco-portal.com/>

Environmental Sustainability Blogger

<http://www.eco-portal.com/blog/>

World Watch Institute

<http://www.worldwatch.org/>

Sustainable Development Principles

<http://www.sustainable.doe.gov/overview/principles.shtml>

Sustainability links

<http://www.usgbc.org/Resources/links.asp>

Renewable Energy Policy Project (REPP)

<http://solstice.crest.org/>

Earth Pledge Foundation

<http://www.earthpledge.org/>

U.S. EPA Pollution Prevention Program

<http://www.greenbiz.com/frame/1.cfm?targetsite=http://www.epa.gov/p2>

The Talloires Principles

http://www.ulsf.org/pdf/TD_resourcekit.pdf

Coalition for Environmentally Responsible Economies

<http://www.ceres.org/>

Buying, Building, Working Green

Green product recommendations

www.greenseal.org

Co-Op America's Green Pages

www.greenpages.org

EPA's Green Procurement Guidelines

www.epa.gov/cpg/index.htm

The Green Guide

www.thegreenguide.com

Center for a New American Dream

www.newdream.org/procure

Consumer's Choice Council

www.consumerscouncil.org

Environmentally Preferable Purchasing Program and Database

www.epa.gov/oppt/epp

GreenOrder

www.greenorder.com

Green Seal

www.greenseal.org

INFORM

www.informinc.org

North American Commission for Environmental Cooperation

www.cec.org/programs_projects/trade_envIRON_econ

Recycled Products Purchasing Cooperative

www.recycledproducts.org/index.html

Energy Star

www.energystar.gov

Global Ecolabeling Network

www.gen.gr.jp

Teaching Sustainability

National Wildlife Federation Campus Ecology Program

www.nwf.org/campusecology/index.cfm

The Green Teacher

<http://www.web.net/~greentea>

The North American Association for Environment Education

<http://naaee.org>

The Environmental Literacy Council

<http://www.enviroliteracy.org>

The Institute for Deep Ecology

<http://www.deep-ecology.org>

The Institute for Earth Education

<http://www.eartheducation.org/default.asp>

Schools Going Solar

<http://www.ttcorp.com/upvg/schools/index.htm>

GreenNet

<http://www.gn.apc.org>

Education Resources for Cleaner Production and Pollution Prevention

<http://www.cleanerproduction.com/sectors/educatio1.htm>

Green Design Education Initiative

<http://www.idec.org>

Learning Sustainability

List of Environmental Degree programs

<http://www.ecojobs.com/programs.html>

List of Green Building degree programs

<http://www.sustainable.doe.gov/buildings/gbedtoc.shtml>

University Leaders for a Sustainable Future

<http://www.ulsf.org>

Higher Ed Network for Sustainability and the Environment

<http://www.secondnature.org>

The Sustainability Education Center in NYC

<http://www.sustainabilityed.org>

The Center for Regenerative Studies

<http://www.csupomona.edu/~crs/>

Clarkson University's Environmental Sustainability Initiative

<http://www.clarkson.edu/sustainability/>

Initiative on Science and Technology for Sustainability

<http://envlib4.harvard.edu/envath/scisust.html>

The Research and Assessment Systems for Sustainability Program

<http://sust.harvard.edu/>

Portland State University (PIIECL)

<http://www.piiecl.pdx.edu>

New College of California

http://www.efswest.org/resource_center/profiles/newcollege.html

University of Michigan

<http://www.engin.umich.edu/prog/consensus/>

Akamai University, Hawaii

<http://www.akamaiuniversity.us/degrees.html>

University of Minnesota

<http://www.fw.umn.edu/ISEES/>

The Green Design Institute at Carnegie Mellon

<http://www.ce.cmu.edu/GreenDesign/>

The Institute for Sustainable Design at UVA

<http://www.virginia.edu/arch/dept/urban.html>

Second Nature: Education for Sustainability

http://www.secondnature.org/efs/efs_sdprofiles.html

Professionals for Sustainability

Architects / Designers / Planners for Social Responsibility

<http://www.adpsr.org/>

Smart Communities Network

<http://www.sustainable.doe.gov/>

Sustainable Architecture, Building and Culture

<http://www.sustainableabc.com/index.html>

Sustainable Communities Network Case Studies

<http://www.sustainable.org/casestudies/studiesindex.html>

The Natural Step

<http://www.naturalstep.org/>

Environmental Building News

www.buildinggreen.com/

Green Design Network

www.greendesign.net/

International Institute for Sustainable Development

www.iisd.org/default.asp

Sustainable Building Design News Digest

www.greendesign.net/greenclips/index.html

Top Ten Sustainable Architecture WebPages

www.tenlinks.com/Architecture/resources/sustainable.htm

U.S. Green Building Council

www.usgbc.org/

The Environmental Literacy Council

<http://www.enviroliteracy.org/subcategory.php/23.html>

GreenGuard Environmental Institute

<http://www.greenguard.org/aboutus/overview.asp>

Regenerative Design

The Regenerative Community

<http://home.earthlink.net/~moodyde/RegComm1.htm>

The Regensis Group

<http://www.regenesisgroup.com/articles/regenarticle.html>

Eco-Friendly Gift Ideas, for year 'round giving

Real Goods

<http://www.realgoods.com/>

Green Marketplace

<http://www.gaiam.com/greenmarket/>

Seventh Generation products

<http://www.seventhgeneration.com>

PEOPLink

<http://www.peoplink.org/EN/0.html>

National Green Pages

<http://www.greenpages.org/>

The Big Love Gift Guide

<http://www.barkingowl.com/cc/>

EcoCities Gift page

<http://www.ecocities.net/Gifts.htm>

FindGift.com eco-friendly gifts

<http://www.findgift.com/Categories/Eco-Friendly/>

Eco-Artware.com

<http://www.eco-artware.com/index.shtml>

Happy Hippie

<http://www.happyhippie.com/directory/artgallery.htm>

Main St. Online Eco-friendly gift guide

http://www.mainstonline.com/shop/environment/eco_friendly.htm

Eco-friendly gift guide

http://shopping5.com/index.php?t=sub_pages&cat=6032

Greener, Healthier, Friendlier Gifts

<http://www.planetfriendly.net/gifts.html>

Sustainability News

Go to <http://www.eco-portal.com/news/sustainabilitymore.asp> for the latest news.

Biohabitats - People, Projects and Places

Ricardo Gonzalez Joins the Team

Ricardo comes to Biohabitats as an Environmental Scientist with a penchant for urban stream restoration work. He brings seven years of experience and bolsters the team's work with stream and watershed assessment and design and wetland mitigation and monitoring. When not mucking through the mud or computer modeling, he enjoys playing with his daughter, hiking and cooking.

Jessica Daniele – our new Accounting Manager

Jessica dreamed of becoming a graphic artist. So when it came time to select a major in college, she naturally chose... accounting? Yep, that's right. Jessica decided to make art her hobby while focusing her career on numbers. She brings over six years of accounting experience to Biohabitats. Her columns and spreadsheets may never hang in a gallery, but they sure do look pretty.

Tom Dunham – keeps all things computer, running

Tom is our IT, Web, and general user-support guy, in charge of everything that hums and has blinking lights. He's getting married in the Spring of 2004, is an avid fly-fisherman, endlessly patient and is currently completing his degree in Computer and Information Science.

Ecological Sustainability Site Plan, Columbia, Maryland

Biohabitats will work with a local land developer to conduct an ecological analysis and create framework for developing a 30-acre mixed-use site using regenerative design initiatives. Initiatives will focus on biodiversity conservation, regional landscape ecology, hydrologic cycle, energy flows and nutrient cycling.

On-Call Ecological Restoration Services, Rockville, Maryland

Biohabitats will be providing open-end environmental restoration services that include the planning, assessment and restoration of streams, wetlands, and native grasslands

(meadows); soil bioengineering; exotic invasive species control; woodland restoration; stormwater quality and quantity management; and natural area maintenance and management.

Cypress Creek Stream Restoration Design, Houston, Texas

The Harris County Flood Control District retained Biohabitats to prepare a plan to restore Cypress Creek. The Cypress Creek watershed, northwest of Houston, is under increasing pressure as the suburbs of Houston grow. Recognizing that past structural approaches to channel stabilization and flood control cause long term ecological damage, the HCFCFD asked Biohabitats to focus attention on two scales; a master plan for the entire Cypress Creek mainstem, and a site specific natural channel design for approximately 7,000 linear feet of channel. Biohabitats will be providing design, permitting and construction oversight services.

Tates Creek Stream Mitigation, Madison County, Kentucky

As the third project to come out of an on-call environmental services contract with the Kentucky Transportation Cabinet, Biohabitats will provide stream mitigation services for Tate's Creek in Madison County, KY. We will assess existing conditions and mitigation opportunities; develop natural channel design concepts for stream relocations; prepare final design and construction drawings, specifications, and a cost estimate; and assist in the preparation of permit applications.

Leaf Litter is a publication of Biohabitats, Inc. Coinciding with the earth's biorhythms, it will be published at the Fall Equinox, Winter Solstice, Spring Equinox and Summer Solstice to probe issues relating to ecological restoration.

Biohabitats is a design and consulting firm specializing in ecological planning, assessment, design, construction oversight, monitoring and outreach. To learn more about our ecological services, mission and vision, visit us at www.biohabitats.com.

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