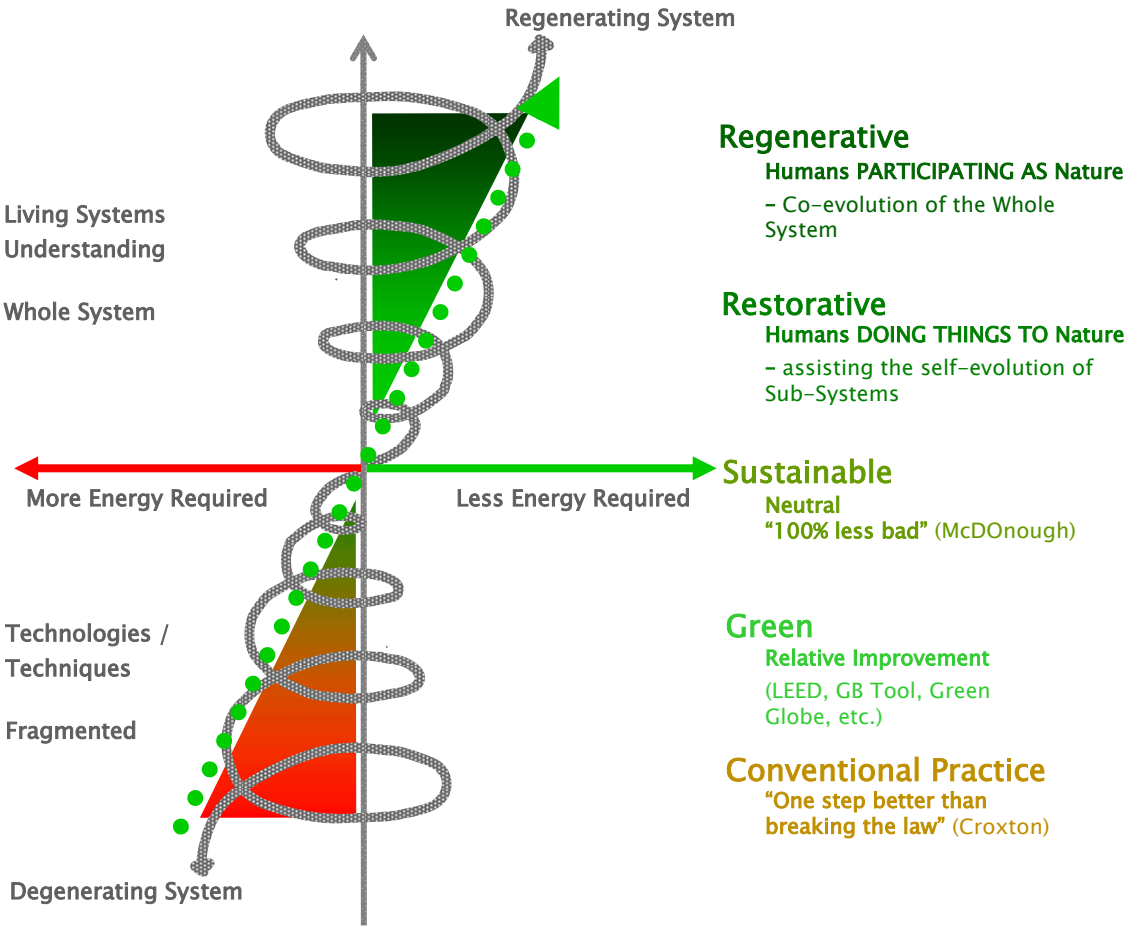

Trajectory of Environmentally Responsible Design

The Trajectory of Environmental Design

Limiting the Damage (still Degenerating)

- **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 - some people believe this is more applicable to buildings and technology.

Neutral

- **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. Sustainability is an inflection point from degenerating to regenerating health.

Restoration

- **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 healthy state of self organization (e.g., a local wetlands, woods, riparian system, etc.)

Regeneration

- **Regenerative Design** - This is a design process that engages the whole of the system of which we are part. This is place-based design. By engaging all the key stakeholders and processes of the place – humans, other biotic systems, earth systems, and the consciousness that connects and energizes them– the design process builds the capability of the people to engage in continuous and health creating relationship. There is continuous learning and feedback so that all aspects of the system are an integral part of the process of life in that place – co-evolution.

In General:

- **Sustainability**, as currently practiced, addresses generalized and planetary issues by limiting the intensity of the damage we cause
- **Regeneration** is local in practice, and addresses how we partner and thrive in relationship with the unique social-ecological system of each place.

A Living Systems Approach to Sustainable Design

There is general difficulty in defining sustainability in Western Culture. The efforts usually attempt to define it as an 'it' - as if this objective is an object - something we can make. For example, the terms "tools" and "toolkits" are used as resource frameworks to address sustainable design - as if life can be fixed with technology. Success is often defined with metrics and benchmarks – using the same indicator structure as used in industry. And nature is "mimicked" as if the purpose of other living entities is to have their processes adapted to human intention. Nevertheless, these are good and necessary approaches. But they are incomplete. A literal grounding is needed for the ultimate purpose of sustainability. It is about sustaining life.

To sustain life it is necessary to understand life. The interrelationships between, water, soil, sun, and shelter – the basic systems that support us and all species – need to be addressed as a whole system of life giving processes. Life is a process that is continually making itself and evolving and we, as a society, are an integral part of this process. If we fail to understand this we will fail in our effort to achieve a sustainable condition. Unfortunately, the complex interactions of life and the process necessary to understand the unique nature of the 'whole system' in each place we build require a different design process - a process that identifies the key species and interrelationships that are unique to the place we are building. This takes an iterative process of looking through different lenses at the very beginning of the design – even before site selection if possible. Some of these lenses are energy, CO^2 burden, life cycle assessment, life cycle cost, ever-evolving LEED standards, habitat health, soil health, hydrology, human and ecosystem

symbioses, and so on. Then, this one critical, conceptual step needs to be expanded farther. All of these issues call out to be held and embraced as if they are one whole entity. The pieces need to be understood only as aspects that are in integral relationship with each other – because they are.

This may seem like a lot to grasp but once engaged at a whole systems level one wonders how we, as a culture hopefully striving for unity, could ever have designed without an understanding of the relationship between these vital sub-systems. This takes a bit of extra time in the beginning of the project for people new to this way of working and thinking. Understanding and engaging in this process might be likened to a blind man attempting to understand an elephant. It will take a few circles around the animal in order to understand it with any thoroughness. Viewing sustainability through the multiple lenses of technological efficiency and living system health requires us to weave together the unique patterns of life in each place we build.

The above definitions are what can be called the Trajectory of Environmental Design. Our culture is growing in understanding of how to address and embrace the complexities of living systems. The design professions are rapidly moving to create guidelines of practice that help us move beyond the boundaries of conventional scopes of work

Some Points to Consider on Regeneration

There is really no such thing as a 'regenerative project' – nor can there be – an object by itself cannot be regenerative – it's about the relationships between the objects and how they are continuously evolving that makes them regenerative. Some hopefully clarifying thoughts - Regeneration is a process of engagement with the purpose of healing living systems (humans and "nature") and birthing a new spirit to consciously participate in expanding the healing process. It does this in a way that enriches the possibilities for a greater diversity of living relationships. If a deeper potential for living relationships is not part of the story then it isn't regeneration. Many designers use this word for photovoltaics but that is a subset of what it takes to make life occur on a continuing basis. There are two basic aspects to regeneration:

1. There needs to be a process that helps participants experience the whole system they are part of
    a. I.e., the whole and complex relationship of culture, earth systems, biotic systems, technical systems – this can be done with keystone issues. It doesn't require infinite knowledge.
    b. This cannot be taught. This needs to be experienced. Facts and technologies can be taught, but facts are not 'understanding'. Understanding comes from an awareness of patterns of relationships.
        i. "To understand is to see the way things belong together, and to see why they are together as they are. Understanding relates to underlying patterns, relationship, meanings. If each thing of the world were different from everything else, we should have no hope

of understanding. We would have to rely on knowing everything uniquely and piecemeal " (Bennett)

ii. An example. If I were given the exact bits of knowledge that tell me how to build a solar house, I could be given the knowledge to do so. But if I was told to apply these same facts to a different home in a colder climate I couldn't use the same knowledge. I will need to understand the pattern of relationships – in this case the laws of heat transfer, thermodynamics, and material performance in a harsher latitude to determine the right kind of equipment to use. Now apply this same analogy to plants, microbes, human social systems and culture – it requires a different way of engaging the participants than simply recommending technologies.

c. The design process needs to ultimately become an experiential process based on the foundation of how life works in that place in order to hope to achieve a sustainable condition.

2. Sustaining sustainability.
   a. It isn't sustainable unless the participants in a place, building, etc are engaged in evolving (self organizing around) the process of a healthy, evolutionary trajectory of life. This is the cycling process that self-organizing entities engage in. A spiral of increasing richness and diversity in support of the whole (autopoeisis).
   b. This requires feedback and an organization to receive and act on this feedback.
   c. The design process needs to set up the process of continuing this journey going forward. Jamie Lerner did this in Curitiba. We set up a Core Team to hold and do this

Many projects have the beginnings of this kind of approach – but the story should not be expressed in terms of the technical fragments of the system (energy, water, materials, etc). The story needs to be expressed in terms of the aspects of life, the purpose of sustainability – nourishment, shelter, value adding relationships, (vitality, viability, and evolutionary capability – to use a living systems framework)

There are two avenues of greening in play right now. Both are of critical importance – but let's not confuse the two because they require different mental models. Hopefully these two tracks will merge more quickly than they have been. The first is a "technical" model that is making the attempt to reduce consumption as well as restoring sub-systems such as woodlands, riparian systems, wetlands, etc. This is an important and critical start.

The second track is a living systems approach that engages all of life in an intentional dance – it works with the building of an understanding of the invisible relationships that link the objects of we focus on in Western Society.

The distinction between the two tracks is that of "purpose and understanding".

As stated above, the two tracks of reducing consumption and living system health ultimately merge. The question is, will we learn about the latter if we only focus on the technologies. Perhaps, but it is likely better to be conscious of the difference. That's why we add "consciousness" to the well known statement of the need to move from efficiency to effectiveness – the trend line should read – efficiency to effectiveness to consciousness – we need all three.

A Practice Framework

The following basic structure has been found useful in moving design participants into an appreciation, if not understanding, of the whole of nature. In addition, this structure works to frame a design process to begin addressing our alignment with the life support systems of the planet – call them earth systems, not nature, since we are natural too.

Re: "Practicing the Whole"

The idea is to engage people and other living systems in a dialogue of mutual understanding of the interrelationships of the life support systems of the place they live – this is most easily communicated to people by the metaphor of the "story of Place" (researched and presented by a systems ecologist who knows how to research and interpret the patterns of life in a place). This story engages people in a deeper understanding of the web of life that is unique and important to them because it is about their home. The key is to create a slowly unfolding learning and experiential process working with small groups of people and engaging them in their knowledge and passion of the place they live. The systems ecologist/historian, the designers, and the people of the place learn from each other. This process repeats and enriches itself as more discoveries are made by the design team. The design loops (cycles) back to the different resource people at least one or two more times. These small groups (big groups are not as effective) become infected with a new passion and begin to self-learn among each other – a viral-like process that is the beginning of new understanding, compassion, and passion for the whole system that they are part of.

There are two basic parts to this work:

1. The community (or company, etc.) needs to experience the whole system they are part of.
    a. This cannot be taught. This needs to be experienced. Facts can be taught, but facts are not 'understanding'. Understanding comes from an awareness of patterns of relationships.
        i. "To understand is to see the way things belong together, and to see why they are together as they are. Understanding relates to underlying patterns, relationship, meanings. If each thing of the world were different from everything else, we should have no hope of understanding. We would have to rely on knowing everything uniquely and piecemeal " Bennett, Elementary Systematics

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2. Sustaining sustainability.
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   b. This requires feedback and an organization to receive and act on this feedback.
   c. The design process needs to set up the process of continuing this journey going forward. Jamie Lerner did this in Curitiba. We work with the client to set up a core team to do this – to manage visionary and continous evolution and change.
   d. "Change" is one of the hardest things for humans. The work of sustainability is ultimately "developmental" work. We find that our most successful projects are those where the client was involved in their own personal development work (spiritual journey, therapy, etc.). Building on this, we find that companies and design teams also need to be involved in organizational development work or they typically do not function well with accomplishing the deep integration that a sustainable project requires. Integral to sustaining sustainability therefore is a design process that includes the creation of a new mind to achieve the changes necessary.

1) Setting the Stage – understanding and aligning human aspirations of a project

To understand the objectives of a project, it is necessary to understand the core drivers of why the project is proposed in the first place and what people value and perceive as significant about the Place they inhabit. It is necessary to elicit from the participants the aspirations they have about this project and locale. Questions about what is driving this project, what is important to the client and design team are elicited in a group dialogue. It is significant to note the difference between the visions participants may have for a project and their aspirations.

- A vision, as it is used in planning processes today, is basically a wish list of desirable features or wants by the project constituents. These "visions" may amount to dozens of multi-paged flip chart lists. Sometimes there are contradictory issues that cause more disagreement among participants than alignment around a purpose.
- An aspiration is a deeper, heartfelt core purpose (aspire, breathe, spirit) that, if elicited in the course of the design process, becomes a fundamental objective of the project in very general terms. The generality gives the design process flexibility. The core purpose gives the design process the energy to find solutions that support both the aspirations and the nature of the place. There are likely only a dozen or two aspirations; these are common to most everybody – readily available food, health, family, security, love, the opportunity to voice concerns and be heard, freedom to practice beliefs, healthy natural systems, honest relations with neighbors, and so on.

With powerful and basic aspirations understood by the participants the way is open to begin exploring how these aspirations can be met within the opportunities and limitations of the nature of that Place. The aspirations open up the possibilities of rich and fruitful dialogue with the participants as opposed to laundry lists of 'visions' that may pit sides against each other.

This process is useful for two reasons: 1) by eliciting the core purpose of the project the many members of the client and design team have the opportunity to see beyond the simple building program and question assumptions; 2) this has the potential of aligning the design team around the purpose of their work. When working on unique projects, in unique places and solving problems to realize unique solutions requires that design teams break out of past practice patterns and expectations. Without this kind of process it is unlikely they will realize the deepest potential of a whole system solution.

This work is preferably done before a site is selected or the design process has begun.

2) Learning about the Place

In order to address the health of an ecosystem and our role in it, we need to understand how it works and how humans have interacted with it through history. By understanding the patterns of evolution and health in a watershed the relationships between the systems (human, plant, animal, hydrology, meteorology, geology) can be understood with a level of approximation. When did life express itself more fully than other times; why; what occurred to change these relationships; and so on?

This knowledge gives us the opportunity to identify the key systems and keystone species in a place that made it work more effectively in the past and may provide new opportunities in the future – particularly in alignment with current aspirations of the people in that place. This process helps to identify the key <u>connections</u> between people, natural systems, and technology; the connections that catalyze or limit the potential for a healthy whole.

Place = Core identity of the relationships of human systems, other biotic systems, earth systems, and the consciousness / spirit that connects them. ®Regenesis

3) **Frame/sketch/outline the story of place**
By expressing these relationships in the form of a "story of place" it is possible to more quickly engage the layperson in an understanding the complex relationships in an ecosystem and their role within it.

The story of place as a context serves multiple purposes. First, history has shown that we will not sustain the will needed to make and maintain the needed changes, day after day, without evoking the spirit of caring that comes from a deep connection to place. Second, discovering the story of a place enables us to understand how living systems work in a particular place, and provides greater intelligence about how humans can then align themselves with that way of working to the benefit of both. Third, the process of learning about the Place requires engaging individuals and small groups to learn what they know. The process of dialogue – exciting people about what the land assessment has taught the assessors and enriching this understanding with the history shared by the people – leads to a trusting and deep engagement. Finally, the story of place provides a framework for an ongoing learning process that enables humans to co-evolve with their environment.

4) **Marrying story of place with aspirations for future**
This is the point where conceptual design can begin. From working through the above steps there is a foundation established that the design team can respond to: real issues of the environment and the aspirations of the people in relation to the opportunities in the ecosystem.

At this point it is essential to form a Core Team to hold the aspirations in relation to the health of the place and project. This team's responsibility is not in day-to-day activities but to remember, hold, and promote the higher aspirations and visions of the project – to hold the core which energizes the design process and on-going resiliency/health of the Place.

5) **Identify indicators**
Once the keystone species and key systems are generally understood it is necessary to establish metrics and benchmarks to measure levels of improvement. No one can be sure that the understanding of the ecosystem is correct or that the people engaged with the system will interact in the assumed way. Monitoring the success of this work is essential to receive the feedback necessary to allow a system to evolve.

6) **Integrative Design/Construction Process**
All the design work should support the establishment of the health of the whole as well as other non-conflicting or at a minimum, neutral to the system, objectives. The process of optimizing each system and part in relation to the whole requires more than a few iterations of thinking. Since we work within the framework of time – a

linear process – we need to approximate the simultaneity of the whole by rapid iteration of ideas.

7) **Sustaining Sustainability**
Ongoing Feedback (maintaining a humble relationship with Place)
Continuous monitoring and measurement as well as feeding the results back to the Core Team that holds the long term aspirations for the project.

This process is similar in perspective to Seven Generation thinking. We incorrectly believe Seven Generation perspective is one that asks us to think seven generations in the future. The more basic and practical interpretation is that we must consider the Three Generations in the past, the Present Generation, and Three Generations in the future before we consider any action. The steps outlined above follow this structure.

Some Examples of a Regenerative Approach
At the local earth system level:

Loreto Bay, Loreto, Baja C.S., Mexico: 400 years ago the Baja Peninsula, was a land of springs, marshes, and scrub oak woods. Importing European farming practices and grazing animals created the desert we know today. The possibility of developing a new community brought the necessary resources to systematically begin the restoration of the mangrove estuarine system which is the source of shelter and nutrients for the interrelation of plant, animal, and fish habitat as well as building dams in the upper arroyos to help recharge the water table when it rains. Greater diversity of life and value for the property owners was created through the reestablishment of the key natural systems of this area. People and nature will be in mutual benefit. In this case, without responsible development this area of the Baja would likely continue in a degraded state desert state. Now, more frequent flowing water is occurring, the ground water is higher – greater flows will develop over the next 15 to 20 years. Regeneration of this place requires people to be engaged in the process of restoration on a continual basis. The design process is meant to function as a catalyst for evolutionary change. The real impact of sustainability comes from sustaining the will and understanding of people and place working together to create greater diversity, resilience, and health.

At the community level:
The Brattleboro Coop:
Instead of simply renovating their store into a “green” grocery store the Coop asked for a Regenerative approach. Most of the energy expended in the business of a grocery store is in shipping each bite of food an average of 2,500 miles in the northeast USA. Through a design process that looked to restore the health of the habitat, water, and soil in the Brattleboro watershed, as well as other local farms, it was demonstrated that much of their food could be grown close to home. The purpose of the Coop and its members is reframed. They are changing from being a simple grocery store to a community resource that is intentionally looking to create a sustainable food network by bringing resources together and creating greater diversity and health in their community and ecosystem.

A comparison of a technical approach and a living systems approach

Willow School, Bedminster, NJ

The technical, functional green story of The Willow School:
A new 200 student private school, grades kindergarten through eight, the Willow school includes teaching environmental stewardship as one of its three fundamental teaching objectives and sought to make its site a living classroom. Solution: the site is being designed around ecological system regeneration, with the treatment and utilization of water that mimic natural processes is a core organizing principle. The design includes a constructed wetland for wastewater treatment; use of permeable paving, living roofs, bio swales and 60,000 plugs of adapted specie meadow plantings to reduce stormwater runoff; use of an extended detention, deep pool wetland for stormwater treatment; collection of rainwater for irrigation and toilet water supply. Students and visitors will be engaged in "the story" of the school's environment and the use of nature-based designs will help demonstrate the connections to the planet (upstream and downstream).

The more compelling and vital story of the Place
All of the design features integrate into the great expression of forest that was once there. The building, site, and inhabitants begin the process of functioning like the ecosystem that earlier human habitation replaced. That is the context and the real educational opportunity for students and community on the site. It is also the highest potential expression of living watershed on the site. The forest is the most diverse opportunity for self directed total immersion learning. There is also the opportunity to demonstrate how the forest on the site is becoming a living sponge and filter that is the natural response to climate (40 inches of precipitation), geology, soils and interaction with people. The forest which now is at an early order of expression (low level of succession) will evolve to higher levels of effectiveness and increasing capability to support life while it stores, filters, and gradually releases stormwater.

Students can affect an accelerated succession process and study the total yield and potential of a healthy forest. This is the story about the Willow School, its place, and people’s potential role in creating greater health.