

LANDSCAPE ECOLOGY

by David Pais

"The wilderness rose up to it,
And sprawled around, no longer wild."

Anecdote of the Jar
Wallace Stevens

I. Introduction—The loss of the wild from our landscapes

We need to seriously reconsider what is "traditional landscaping"—replacing native vegetation with exotics (non-native), and thereby substituting a high-input, resource-intensive system for a self-maintaining natural system. This false aesthetic has resulted in a loss of much that is truly unique in our native flora and caused a distortion of our sense of the wild.

The effect is analogous to what poet Robert Bly claims in his book, *Iron John*—that, in our effort to tame, civilize, and control nature both outwardly and within, we have lost the wild, creative, and spontaneous parts within ourselves (Bly, 1991).

Gary Snyder makes a similar point in describing all the negative associations with the word "wild"—uncontrolled, uncivilized, unrestrained, violent, destructive, unruly, uncultivated, uninhabited, etc. "Wild is largely defined by what—from a human standpoint—it is not." He suggests that we consider the positive connotations: "of animals—free agents living within natural systems; of plants—self-propagating and self-maintaining; of land—a place where the original and potential vegetation and fauna are intact and in full interaction. ... a landscape entirely the result of non-human forces" (Snyder, 1991).

How many current perceptions regarding nature, both in the woods and in people's own back yards, are still being influenced by hidden assumptions—the control and domination of nature. Attitudes regarding the wild have become as fragmented as many of our ecosystems. Many *Serenoa* and other types of native vegetation are still being extirpated because homeowners think they harbor rats, snakes, and roaches. The fear of nature is still very much alive today, even though often what is left of nature is a controlled

and manipulated remnant of past grandeur.

Most landscaping efforts would best be thought of as ecological restoration. One of the best proposals for defining ecological restoration is "the process by which damaged ecosystems are returned to a state of health." The possibility of a more restorative and regenerative approach to landscape may provide a solution to many current practices which, by and large, are a denial of the wild and a repudiation of nature.

II. The Limits of Native Landscapes

Native plant enthusiasts have made great progress in changing public attitudes and aesthetic perceptions of our native flora and its value for horticulture. In addition to popularizing many new species, the increased awareness of the widespread loss of habitat and the increasing environmental costs of conventional landscapes has raised fundamental questions regarding both the desirability and sustainability of traditional landscapes.

However, in popular opinion, a great deal of confusion still exists regarding the use of terms to describe the origins, ranges, and distributions of plant species found within the state. Technical terms used by botanists are often misunderstood by the general public. The commonly used distinction between native and exotic plants, which formed the basis for FNPS and the native plant movement, may no longer be adequate in describing and categorizing the incredibly diverse plant pallet now growing within the boundaries of the state.

Many people still associate the term "native" with commonplace, ordinary, and uninteresting, while they desire their landscapes to be "exotic", as inter-

preted to mean 'colorful, enticing, and strikingly beautiful.' Another problem also exists in that many people are unable to recognize the difference between an exotic species that may be well adapted to a site and a suitable component in a "naturalized landscape" from a plant that is invasive and inappropriate.

The exotic/native distinction also fails to account for species of uncertain nativity or for other species that may be well-adapted and non-invasive although technically non-native. I have in mind species that fit within the biogeographical range but lie beyond the state boundaries.

What is needed is not a simplistic characterization of a plant as native or exotic, but a full assessment of the merits of a plant species based upon its origins and its ecological appropriateness in the landscape. I feel it is critically important to become more sophisticated and specific in our descriptions of native versus exotic plants. Public confusion combined with nursery industry backlash over cultivation of exotics could potentially damage the native plant movement if we take a too restrictive approach. Ultimately, what seems most important is context; that is, recommending species that are adapted and may thrive within the environmental limitations of a particular site.

The resolution of these issues will shape future discussions about native and exotic plants, while redefining the boundaries of native landscapes. The challenge exists for cultivated landscapes to be transformed to assimilate native communities and express a sense of wilderness, and ultimately to go beyond what Brazilian landscape artist Burle-Marx calls 'the unnatural art of the garden' (Burle-Marx, 1991).

III. The Exotic Invasion

The "discovery" of America in the mid-fifteenth century by Columbus is arbitrarily suggested as the time before which plants existing in the state are considered "native" (Ward, 1978). This

is somewhat problematic, for it largely ignores the dispersal and distribution of many useful plants by the indigenous tribes of Florida and the Caribbean.

The new list of potentially invasive pest plants formulated by Daniel Austin for the Exotic Pest Plant Council (EPPC) lists over 100 species that have the possibility of disrupting our native ecosystems (Austin, 1992). Myers describes over 80 distinct habitats occurring within the state (Myers and Ewel, 1991). This ostensibly means that there exists over one exotic pest plant for each habitat throughout the state. Many of these species are still widely grown in the nursery trade and planted in the landscape—and the problem is no longer only a south Florida concern.

As protectors and defenders of our native flora, we should attempt to identify the true problem plants that are still being widely distributed, while also accepting that people are always going to want to grow some exotics. We should continue working to increase the awareness of the beauty and diversity of native species while promoting the desirability of native landscapes.

One goal of the native plant movement should be, not only to transform public perceptions of the value of

native species for horticulture, but to increase awareness of the real threat that invasive exotic species pose to the integrity of our natural areas. It is becoming clear that we can accomplish this goal more effectively through education and information than by chastising homeowners and nursery men of the errors of their past practices. The exotic invasion is a real threat that FNPS must take seriously. The purist and rather simplistic approach of extolling the virtues of all native species, while banishing all exotic species as evil, can cause more harm than good by alienating the nursery industry and polarizing public opinion. It may be in our best interests as a society to reach some compromises with the industry and the public in an attempt to identify and deal with the real enemies. A possible starting point may be to abandon the rigid distinctions and oversimplifications between exotic versus native species and to redefine these terms more precisely.

**"The right thing, is what is left
After everything else has been done wrong"**

Robin Williams

IV. The Naturalistic Continuum

Species Level—It is helpful to sort out the terms used to categorize various degrees of nativity and then rank and organize these descriptions along a proposed native/exotic continuum. Here is a proposed set of definitions:

Native—an indigenous species thought to historically occur within a particular biogeographical region, self-propagating and established prior to human influence (or European settlement); e.g., [*Sabal palmetto*].

Uncertain—A species of uncertain or questionable origin, which may or may not have occurred prior to European settlement; e.g., *Duranta repens*.

Non-native—A species which was introduced after European settlement, specifically including species that occur within the same biogeographical region; e.g., *Amphitecna latifolia* (black calabash).

Foreign—An introduced species from a different biogeographical region, but which may be well adapted. This term is reserved for non-invasive, environmentally benign plants that may merit landscape usage; e.g., *Rhaphiolepis indica* (India hawthorne).

Exotic—Introduced species from a different biogeographical region, which may be potentially invasive, has the potential to naturalize, or is widespread and can form dense, monotypical populations (these are in Categories III and IV on the Exotic Pest Plant Council List); e.g., *Widelia trilobata*.

Alien—An introduced, widespread species with the established ability to invade, disrupt, disturb, and/or destabilize natural systems; a noxious pest plant (Category I and II on EPPC List); e.g., *Casuarina* spp.

Systems Level—Analogous to the species ranking along a continuum, natural areas and landscapes can be arranged under definitions such as these:

Wilderness—The state of nature existing prior to human influence and intervention; a self-regulating, self-maintaining, self-propagating system, flourishing from innate qualities; pristine.

Biogeographically accurate—a system exhibiting the species diversity, stability, and associations that are thought

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to represent a particular biological and geographical region.

Historically authentic—a system exhibiting the species diversity and associations that historically existed prior to active human intervention or other specified time period.

Ecological restoration—an attempt not only to revegetate but to recreate habitat, restore form and function, return a damaged system to a state of health, and reestablish self-maintenance.

Restorative landscape—a landscape of exclusively native species modeled after natural associations, intended to require little or no maintenance after establishment (Bissett, 1991).

Native landscape—a landscape of primarily native species that are grouped with regard to natural plant associations and habitat requirements (Xeric Landscaping with Florida Native Plants, 1991).

Naturalized landscape—a landscape of natives, non-natives, and foreign species designed to be low maintenance.

Foreign landscape—a landscape composed primarily of environmentally benign exotic species that do not make high resource demands ("zero-scapes" as envisioned by Water Management Districts).

Alien landscape—an artificial landscape composed of invasive pest species without natural analogues, degraded to the point of being unable to reestablish native species or successional patterns without active management or control strategies.

V. Conclusion—Landscape ecology: restoring the wild

We need to rethink our basic assumptions of what constitutes wilderness, native, and exotic systems; how degraded areas can be "healed" and returned to a "wilderness-like" state through restoration ecology; and how we can incorporate some of the positive values of "wild" into our landscapes by creating "cultivated wilderness" areas within the broader context of landscape ecology.

The idea of landscape ecology has grown from interests in restoring habitats, modeling landscapes after natural plant associations, and designs based upon ecological appropriateness and sustainability. This new approach asks us to consider the conservation of biological resources in our landscapes, and suggests that it is possible to some extent to recreate natural plant communities and corresponding animal associations. The

interest in butterfly gardening as well as the movement toward creating backyard wildlife habitats address these concerns—the attempt, on whatever scale, to heal the fragmentation of our flora and fauna caused by the rapid developmental pressures and exotic plant invasion which have so far prevailed.

The principles and practice of landscape ecology are still being defined and developed. In the short run, landscape ecology can change the way we think about nature in our backyards, our gardens, or parks. At best, it may point to the future where the wild regains its proper place within our culture and ourselves.

It is a subtle irony of landscape ecology that, as modeling and recreating natural systems becomes an accepted goal, we will come to evaluate landscapes by how closely they replicate functional, self-maintaining systems and restore in us a sense of the wild. The truly successful ecological landscape may well become one in which the landscape designer's effort

becomes invisible, the native replaces the contrived and artificial, context is more important than content, form and structure are predicated upon function, process takes precedence over product, and plant associations become self-sustaining communities which conserve threatened biological and genetic resources.

Gary Nabhan (1989) has eloquently written of the critical need to reassess our current attitudes and to actively work for wild plant conservation:

"The current rapidity (of change) is now disrupting ancient communities where both wild and cultivated plants have been conserved together for centuries. Something that has long kept our cultigens and even our peopled landscape healthy and tolerable is now disappearing. The valuable entity is wildness. If it is lost from the world around us, we will all lose something within ourselves as well."

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David Pais is a horticulturalist who does landscape design and consulting. This article is from his presentation at the Spring Conference.

"I come to know the seasons
through the wisdom of an owl
As morning beams upon the
marsh
Where haunts the waterfowl...."

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