ZONE ANALYSIS IN URBAN PERMACULTURE

by Katherine Waser

In permaculture design, the concept of zones provides a means for analyzing and exploiting characteristic human energy flows across a site. You analyze this human energy flow by asking yourself: where in my yard do I like to hang out? Where is it pleasant on a hot summer afternoon? How about on a cold windy winter day? What pathways do I characteristically follow, to take out the garbage, to get to the car, to hang up the laundry? By considering these points, and perhaps making a rough sketch, you begin to create a map of how your energy intersects with your space. This analysis is a form of pattern understanding. You exploit this pattern understanding by combining it with sector analysis—that is, the analysis of how large-scale energies like sun, wind and rain flow across your site—to design opportunities for gardening into those spots in your yard where the combination of all energy flows is most advantageous. Thus, sector analysis is about figuring out how to place a design element to get maximum benefit from non-human energies; zone analysis is about exploiting your own characteristic patterns of movement to place a design element where you will most naturally and easily be able to give it whatever degree of human attention it requires.

It's easy, and accurate, to infer from the zone definitions (see box below) that permaculture in general and zonation in particular were originally developed in the context of rural and semi-rural areas. But how do these ideas apply in the city? What follows are some of my own thoughts on the subject: a point of departure, rather than a final word.

For city dwellers, Zone Zero needs to be given a lot more attention as a potential part or whole of a functioning permaculture design. For example, consider the apartment dweller who has no access to outside land but wishes to start a permaculture garden system, however small (an approach, by the way, that is entirely consistent with the basic permaculture design principle of starting small, observing how the system works, and then modifying your design). In such circumstances, a permaculture design might include a worm composting bin under the kitchen sink to turn organic wastes into high-grade organic fertilizer; a bucket placed in the tub before showering, to catch the water as it warms up (and jars to do the same in any sink); and an indoor crop of herbs and leafy vegetables grown in an eastern or bright northern window, used to turn simple, low-on-the-food-chain meals into culinary heaven. Other houseplants could be added to the system for air filtration purposes—especially important if the apartment is not well ventilated. If our apartment dweller is lucky enough to have a small balcony, the possibilities for design expand tremendously. If the space is sunny enough, an outdoor crop of tomatoes, eggplants, peppers and other fruit crops could be grown in pots. Trellises might be added to the balcony for plant support and might also offer sun control and privacy (an important design consideration for those living in urban neighborhoods).

Another important aspect of Zone Zero design is considering what can be done to control the "climate" within the house to provide greatest comfort for all its inhabitants at the least energy cost. This is even more crucial in cities than in rural areas because cities, with their preponderance of concrete, asphalt, and heat- and exhaust-producing cars and buildings, add greatly to the heat burden we already face in the Southwest. In this case, the easiest scope for improvement is probably with those who are homeowners of detached, older homes, free to devise appropriate retrofits without needing approval from landlords, apartment building managers or housing associations. People who live in these latter situations will have an additional hurdle before they can apply any such retrofits. In this case, cooperating with other residents to create a well researched and documented design may go a long way toward persuading the "governing body" to effect change.

In an urban setting, Zone One and Zone Two often collapse into one intensely managed food producing zone. The small courtyards, patios and yards typical of many townhomes, condos, and duplexes in Southwestern cities are a natural for the highly managed, mulched, densely planted Zone One strategy outlined by Bill Mollison. Herbs and vegetable crops in pots (double-potted to conserve water), dwarf fruit trees in barrels, a 55-gallon drum or cistern under a water spout, a pet rabbit in a hutch as a reliable fertilizer source, could all be design elements in a typical small townhome patio area. In tiny backyards such as those often found in older apartment complexes or duplexes, herb spirals can provide a large and varied growing area in a small space. In larger yards, diverse fruit trees can be grown and stacking of overstory trees/understory shrubs and herbs can begin; chickens in the system provide eggs and fertilizer and can be moved around in a portable "chicken tractor" coop to help prepare garden planting areas; some urban gardeners keep a few beehives or a few goats. Urban front and back yards can typically sup-

THE PERMACULTURE ZONES

Zone Zero is the center of activity (house, barn, or village if the design is on a large scale). It is laid out to conserve energy and to suit its occupants' needs.

Zone One is close to the house. It is the most controlled and intensively used area and can contain the garden, workshops, greenhouse, small animals, compost, mulch, clothesline, frequently-visited or essential small trees.

Zone Two is still extensively maintained, with dense plantings. There are a few large trees with a complex herb layer and understory, especially small fruits; water is fully reticulated (drip irrigation for trees).

Zone Three contains unpruned and unmulched orchards, larger pastures or ranges and main crop. Water is available only to some plants. Animals are cows, sheep, and semi-managed birds.

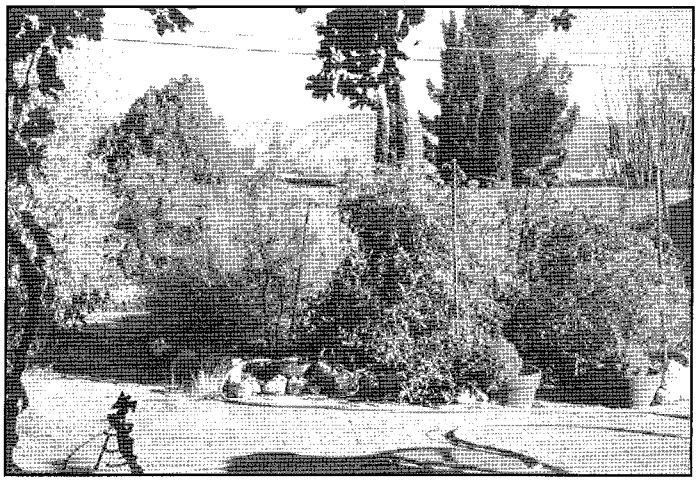
Zone Four is semi-managed, semi-wild, used for gathering, hardy foods, unpruned trees. Timber is a managed product, and other yields are possible.

Zone Five is unmanaged or barely managed natural "wild" systems. Up to this point, we design. In Zone Five, we observe and learn.

Distilled from **Introduction to Permaculture** *by Bill Mollison (Tyalgum, Australia: Tagari Publications, 1991, pp. 10-11).*

"It is possible to envision a city where a web of backyard gardens, neighborhood and community gardens, community-supported agriculture outfits, farmers' markets, and food cooperatives . . . would go a long way toward meeting the food needs of all the city's residents in a sustainable way."

port at least one swale each for passive water capture and storage, and the fences that so typically enclose Southwestern urban yards add vertical space to support vines of sprawling crops like melons and squashes (with water perhaps being supplied by those swales). Urban gardens could be interplanted and shaded by carefully chosen fruit or nut trees, thus combining Zones One and Two in the same space; or, as in my own backyard plan, you might create a sunny Zone One "garden side" and a shadier Zone Two "orchard side". (In the deserts of the Northern Hemisphere, this works best with the orchard situated to the west of the garden, so it can provide afternoon shade for the garden space in summer.) In short, the possibilities for creating the interconnections that make a permaculture garden system work are very rich by the time you are considering an average-size urban lot.



The author's back yard: the view north from the grape arbor toward the keyhole garden (see plan view on the cover)

Zone Three is the least accessible to individual urban dwellers, few of whom own or have access to plots of land large enough to support flocks or herds of animals, windbreaks, wood-lots, etc. Such resources, it seems, would have to exist on a neighborhood or community level. To inspire us in planning such projects, we might look to the centuries-old *acequia* systems used in many parts of New Mexico. These community-built and -controlled irrigation systems, many still in use today, are a wonderful example of community-level cooperation that helps ensure the success and survival of each farmer within that community. While this sort of planning seems far from the current reality of many cities, it could potentially be designed into new or even retrofitted neighborhoods. A cohousing project, for example, could be designed to incorporate a "commons" area, perhaps comprising a woodlot, space for larger animals and appropriately placed windbreaks. A neighborhood association might mobilize inhabitants of an already established neighborhood to plant selected nut, fruit or coppiceable firewood trees within the neighborhood, and also work out a plan for maintaining the trees, harvesting the product and allocating it to neighborhood residents. Approval by the municipal government would probably be necessary for such a scheme; here again a neighborhood association would probably be better able to promote it than one or two individuals would.

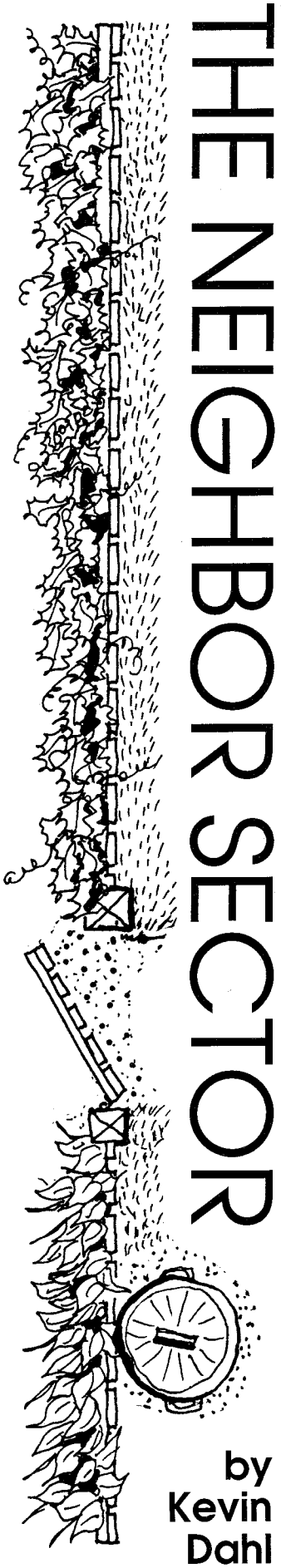
Zone Four, on the other hand, is relatively accessible to urban householders. First of all, many of us can tuck a bit of Zone Four into a corner of our yard; if our yard is too small, we might be able to extend Zone Four into a nearby alley or vacant lot either by inventorying and making use of resources already there (e.g. in our Sonoran Desert bioregion, prickly pears with, fruit to harvest annually) or by practicing guerilla planting. This means scouting the alleys and vacant lots for favorable microclimates (maybe a spot where rain always pools and there's afternoon shade), and planting hardy species that can survive and produce a crop with no human intervention. Many native Sonoran Desert plants, such as mesquite, saguaro and prickly pear, produce edible crops that can be gathered and processed by those who choose to take the time to do so. Many trees also require a certain amount of pruning and can become valuable sources of firewood (mesquites are particularly useful locally in this regard).

For a true Zone Five, you will have to leave the city and hit the nearest trailhead. But I believe there's at least one aspect of Zone Five that we city permaculture designers need to build into our designs more than anyone else does, and that is wildlife habitat. Cities by their nature destroy immense amounts of wildlife habitat, and while we can never restore it completely, we can go a long way toward restoring at least parts of it, thereby making our cities far more pleasant and livable both for wildlife and for ourselves.

On the level of individual yards, creating wildlife habitat generally involves planting native shrubs, trees, grasses and annuals. Sometimes, in fact, wildlife will cooperate with you in this endeavor. My backyard, for example, now boasts a wild sunflower grove, planted by birds just downslope from my irrigated orange tree. For the past three summers this exuberant plot has produced ample food for bumblebees, carpenter bees, leafcutter bees, house finches, sparrows, goldfinches and even hummingbirds, while I profit from a beautiful view sector, entertainment that beats any television show, dead leaves and stalks for mulch, and a self-sowing crop that I'm considering using next summer as trellises for tepary beans (thus combining Zone Four and Zone Five)—all with no work on my part!

The real challenge for integrating wildlife habitat into urban permaculture, though, will come on the level of the city as a whole. Permaculture at its core involves the goal of self-sufficiency in food production; in rural areas where homesites may range from some to several thousand acres in size, this goal is probably achievable at each individual homesite. The same may not be true in the city, where typical lots may be only 1/8 acre or even smaller. However, it is possible to envision a city where a web of backyard gardens, neighborhood and community gardens, community-supported agriculture outfits, farmers' markets, and food cooperatives buying predominantly local produce, dairy products and meat from (permaculture) farmers, would go a long way toward meeting the food needs of all the city's residents in a sustainable way. At the same time, in such a city, individuals, neighborhood associations, parks departments, schools and other civic entities could create backyard wildlife preserves and local wildlife corridors, restore native vegetation, plant trees, and otherwise reincorporate wildlife habitat into the city's overall design. In this way, the entire city could in a sense be "zonified", and the city could become a truly livable community, supporting the lives of plants, animals and humans alike.

THE NEIGHBOR SECTOR



by Kevin Dahl

If your urban neighbors were a sector, would they be a cold blast of north winter wind or more like the warm morning sun? In other words, would you like to invite them into your life, screen them out, or plan for the ability to do both?

Like any other outside energy that affects your design for sustainable living, neighbors can bring great benefits or much heartache. A recent poll in Phoenix, Arizona reveals that neighbors top the list when people are asked whom they trusted most to "do the right thing," with the Pope following at a distant second. Yet a lot of urban violence not attributable to family squabbles arises from neighbors who can't get along. About 10% of respondents to that poll had little or no trust in community members. Trust is a quality that grows over time, a bond that is strengthened with each positive experience. A neighborhood's health, much like that of an ecosystem, can be measured by the number of beneficial connections between its elements. If you are an average urban dweller, at least in any of the larger cities of the American West, you are a relative newcomer in your community. Have you met your neighbors yet? Do you trust them? What have you done lately to build trust, to build community, to make your neighborhood a place that helps sustain you?

With patience, practice, and a willingness to be friendly, you can create a community of neighbors who can be strong supporters of your permaculture design. Many of the world's religions comment on the importance of community and even exhort us to love our neighbors. Writer Wendell Berry points out that this is a difficult but important activity, given that most of us haven't been able to choose which particular people will be the neighbors that we must love. The spiritual challenge is to love your neighbors who just happen to be your neighbors. The permacultural challenge is to create beneficial relations with and among your neighbors so that community spirit and cohesion arise naturally from your design.

So what's to be done to permaculturalize your neighbors and neighborhood? Here are just a few ideas to get you started in your thinking:

Stack time.

Just as we accelerate evolution in the landscape by planting both pioneer and climax vegetation, so too can we accelerate the natural formation of community connections. Organize a block party, start a neighborhood watch, volunteer to have all the kids over at your house on a weekend afternoon so the adults can go see a movie that wasn't made by Disney. A Sunday afternoon potluck can provide great fun for kids and grownups while at the same time getting the word out about the upcoming rezoning hearing for the proposed obnoxious development planned for over yonder.

Build on existing resources.

Does your neighborhood association need a newsletter editor or someone to start a tree-planting task force? If your neighborhood lacks an association, will the city help you organize one? (In Tucson, a community services agency helps mail out notices and find meeting rooms for neighborhood groups. Staff members of city council people can also find appropriate help.)

Invest most of your efforts in regeneration.

Plant trees, and help maintain existing trees. Suggest weekend garden parties during which you and your neighbors build some swales. Invite all the local kids to join you in collecting seeds, and take them on a field trip to revegetate a vacant lot.

Share the excess.

You don't have to be a member of a barter club to make good use of all those eggs your chickens produce—just give them away to your neighbors. My friend Phil takes great delight in distributing his overabundance of veggies. "My garden doesn't just grow food. It grows friends!" he says.

Share tools.

One of my best yard sale finds is a powerful chipper-grinder, which shreds not just my own yard clippings but also my neighbors'. It doesn't make sense for every household to have every tool, not if you and your neighbors trust each other to borrow, respect and return them in good shape and in good time. My friend David and I, sharing a lust for a high-quality laser printer—a model that neither of us could afford separately—purchased one together a few years ago. It's only a minor inconvenience to lug it across the street and back, and for that little effort we both have twice the machine we could have afforded individually.

I encourage you to broaden this list with your own efforts, and soon your neighbors will be as welcome and helpful as the warming morning sun in winter!