

Permaculture Design Process

By Patricia Michael
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Design of Small Land

A small lot is usually in an urban or suburban subdivision. There is a new phenomenon of small lot subdivisions in the countryside, being designed by developers that include strips of greenbelt.

The main challenge of a small lot is to keep the drainage working, to achieve some degree of privacy outdoors if you want it, and to deal with your adjacent neighbors' landscape choices. Small lots come with many givens: sounds, views, smells, lack of privacy, security issues and things that there are too much of. You can have too much shade, sun, water, bad soil, work, mold and purposeless land.

In a small lot landscape design, the parts of the process that are most important are observation and making a list of wants and needs. You do not have a lot of space to solve problems and satisfy desires. Spending time up front finding out what you have to work with and what you want to do with it will save time and money later.

Beginning A Design:

1. Make a Base Map

This will be a map of your design area drawn to scale, with all of what you want of keep on the map. Take these maps to a copy center and make around 5 to 10 copies upon which to put your research observations, and ideas including sketches, bubble plans, and final designs.

2. Observation of Physical Space,

(Walk the site with a camera, and tape measure.

Put your observations on a copy of the base map to show where they are located.

Visit at different times so you can note light changes.

Become conscious – of yourself, feelings, environment

Sit and observe quietly.

Look for animal signs and homes

Know where your utilities are, (call 811 and they will all be marked on the ground with landscape paint which washes off easily)

Make sketches

Take color samples

Take photos

Make notes

Ask yourself what belongs here? Careful site observation will help you with accurate placement.

3. Research

Make sure you can do what you want to on your land. Limits are set by your governing entities and the disaster proofing needed to be safe and make a wise investment.

Find good topography maps of your watershed and note where you are in it.
Learn what goes on in your area, and what is proposed, that may affect your design, noise, views, dust, transmitting towers, neighbors plans, etc.
Make sure you know the setbacks and right of ways on your land.
If you are new in the area, talk to your neighbors to learn about your site.
Study your local weather!!!
Learn what disasters are common in your area and how to take care of yourself and family.
Collect materials to learn your soils, and vegetation. Do soil test if an area isn't growing anything.
If you are building, know the building codes, and health department laws.
Collect articles on Green Building ideas.

Helpful Maps Are:

- A to-scale aerial photo
- Topography map
- A copy of the base map with observation notes
- Destruction and Removal map
- Climate Information map
- Tree survey map and vegetation map
- Utility Map

4. List Wants and Needs

It is very important to separate needs from wants. That will help you to prioritize your design goals and not miss an important need. When you are doing this consider more than one generation, the needs of other species, and how to protect your investment. Needs are things you must have or the design simply won't work for you. Wants are things you would like to have, but if necessary you could do without. It helps to prioritize the lists.

List your design values and ethics to have them clearly in mind. Examples are: Beautiful, Ecological, Water Wise, Kid Friendly, ADA Compliant, and so on.

5. Make a Program

Put the conclusions, from the foundation stage of the design, into a paper with lists, which tell what your design will include. This is called your design program. It is your selection of elements you wish to include in your drawings of the design. It can be a simple checklist of what you want to draw. Have your maps and photos, and notes on hand to reference.

Guides for Land Design Decisions:

A. Zones (placement close or far)

It is useful to consider the site as a series of zones, which can be concentric rings, starting with the home and working out.

The placement of elements in each zone depends on importance, priorities, and number of visits needed for each element, e.g., a chicken house is visited every day, so it needs to be close (but not necessarily next to the house). An herb garden would be close to the kitchen. Proximity invites good management – distance encourages neglect.

The emphasis is on access and schedules.

Examples:

Zone I Start at house doors. Visit daily, Home center, Very intensive, Out-door rooms, Herbs and vegetable gardens.

Zone II Visit several times a week, Well maintained, Dense planting (Use stacking), Some animals, workshop, storage building, well mulched fruit and nut trees.

B. Sector and Orientation (placement for climate and sun shade needs)

The aim of sector planning is to understand from what direction influences come to the property, and how to place elements to make the most of, or protect from those influences. Things to look out for are: Sun, Wind, Shade, Fire, Flood, Friends, Noise, Smells, Dust, Seasonal Changes, Deliveries, and Views. Check your view from each window and door, You can change it with walls, fences, paint and plantings.

C. Slope (placement to save energy and maximize water)

Place an element on slope so that gravity is used to maximum efficiency. Use slope to move materials down hill without added energy. Let slope work for you. The biggest concern for slope is surface water and soil erosion.

D. Guild (the design of beneficial assemblies of companion plants, insects, and animals)

This is an excellent system for increasing yields while reducing maintenance and expenses. Guilds are made up of a close association of species clustered around a central element (plant or animal). This assembly acts in relation to the element to assist its health, aid in management, or buffer adverse environmental effects.

We have long recognized companion planting in gardens as well as crop mixes of various species in agriculture that do well together. Hence the concept of guilds that rely on composition and placement of species that benefit -- or at least do not adversely affect -- each other. Benefits can include the following:

* Reducing root competition from invasive grasses. Almost all fruit trees thrive in herbal ground covers, not grasses. Comfrey, for example, allows tree roots to feed at the surface and produces mulch and worm food when it dies down in winter, while spring bulbs (daffodils, Allium species) die down in the summer and do not compete with trees for water during warm dry periods.

* Providing physical shelter from frost, sunburn or the drying effects of wind. Examples are hedges and borders of hardy trees and shrubs that deflect strong winds, and scattered trees that provide partial shade for crops such as coffee and cocoa.

* Providing nutrients in the form of leguminous annuals, shrubs or trees.

* Assisting in pest control by providing chemical deterrents, Tagetes like Marigolds fumigate the soil of certain types nematodes. Some plants host insect predators such as dill, carrot and fennel (Umbelliferae). Use animal foragers such as chickens to clean up fallen fruit.

Plants can be defined as interacting positively or negatively in regard to pest control in the garden, orchard and cropland. Of great importance in crop mixtures are pest interactions and functions of the plant species involved. Some of these are as follows:

* Insectary plant: The plant acts as a host (a food plant) for predatory insects that prey upon the crop pests.

* Sacrificial plant: Pests prefer to attack this plant, but this does not prevent it from setting seed. Other plants nearby escape severe predation.

* All-season host plant: Pests overwinter or live in this type of plant, enabling them to build up larger populations (e.g., pests of citrus are hosted off-season by oleanders).

* Predator or pollinator attractor plant: The crop or hedgerow species provides flowers to feed the adult predators (e.g., buckwheat in or near a strawberry crop).

* Trap crops: Some crops can attract and kill pests, or the pests can be caught or destroyed on these crops.

Trees, shrubs, flowers and vines all serve these important functions. Anyone who carefully selects hedgerow species to be in one or more of the above categories has substantial pest control capabilities.

If we have a system with diverse plant and animal species, habitats and microclimate, the chance of a bad pest situation arising is reduced. Plants scattered among others make it difficult for pests to go quickly from one food plant to another. However, once pests do breed on any one tree, insect predators perceive this as a concentrated food source and congregate to take advantage of it. In monoculture, the food for pests is concentrated; in a polyculture the pest itself is a concentration of food for its predators.

E. Stacking (vertical design)

For example: root plants, ground cover, shrubs, understory trees, and over-story trees.

F. Apply patterns effectively






Design emphasizes the patterning of landscape, function and species assemblies. Every day we work with pattern in design. It is the basis of all computer design, management, financial systems, social systems, health and healing. Use pattern to organize and support functions. On City lots the basis of organization and strength of the design is the pattern of hard surface to planting areas.

The Basic Patterns Nature Uses to Organize are:

The Branch:

The Branch gathers, collects and distributes the flow of water, air, energy or material. Having a walk divide several times is a great efficient way to move to different destinations in a yard and have the most area visited with less hard surface.



<p>The Net: The <u>Net</u> or <u>Mesh</u> is useful for sorting, collecting, filtering and small surface exchange. It distributes tension and distributes force. Planting in a net pattern supports slopes and makes it harder to see into a property. Using a grid pattern of hard surface has become the most popular patters in Austin landscaping.</p>	
<p>The Lobe: The <u>Lobe</u> provides surfaces for exchange. The edge is the most productive and fecund part of a system, where the most interesting things happen. Placing lobe gardens along a walk increases productivity and interest.</p>	
<p>The spiral The <u>Spiral</u> has the function of speeding up or slowing down, A spiral walk in a yard makes a yard seem larger. This is an interesting pattern for a back yard.</p>	
<p>The Wave: The <u>Wave</u> patterns –When you zigzag a fence it is stronger and repels sound better. Also it provides places for small plantings on the edge of a patio.</p>	
<p>The Scatter: The <u>Scatter</u> pattern introduces the element of chance into a system. It breaks things up and slows them down. A forest grows in a scatter pattern. A scatter pattern of rocks beyond a splash plate breaks the water up, slows the water down, and oxygenates it. It is a good pattern to plant trees in if you want a forest/shade quality to your yard and makes for a good windbreak.</p>	

G. Analyze the Synergy of Elements

Make sure each element in the design has its functional support nearby. For each element ask: "Where does this element go? How can it be placed for maximum benefit in the system?" What does the element need? List the elements together in sets, like outdoor kitchen, herb garden, chickens etc. Make sure all needs of each use are placed together.

A great game to play is to see how many functions or services one design choice will serve. Balance water, plant, and hard surface in proportions that mimic your bioregion for harmony.

H. Put time in The Design

- Leave enough space for things to grow/happen.
- Plan things close together so they will force each other taller sooner.
- Plan temporary choices to hold space.
- Plan to do everything at once in each area to save energy and budget
- Design in stages if the budget requires.
- Sequence; imagine how you would move through the finished plan. Consider expansion/contraction, light/dark, closed/open, slow/fast, alone/together, short/long, and steep/level.

- Plan for seasonal and diurnal cycles.

I. Create Micro climates to passively cool, heat and protect

To cool, use these:

- Screens and shade sails
- Orientation and aspect: use north-facing structures
- 90-degree angles
- Transpiration
- Shade
- Places open to summer cooling breezes
- Venting
- Have outdoor utilities for misters, fans, and sprinklers.
- Create outdoor evaporative cooling.
- Design growing walls.
- Use solar cookers (instead of heating the house with a stove).
- Wind chimney
- Wind directed under shade

To warm, use these:

- Windbreaks
- Convection and radiant heat transfer, i.e. mass
- Sun traps
- 45-degree angles
- Orientation and aspect: use south and west facing structures.
- Mechanical heaters
- Fire pits
- Heat reflected from mirrors.

To both heat and cool, use these:

- Vines
- Insulation
- Radiant heat reflection
- Design microclimates and niches

J. Assist Water to do its Duties

Rain gardens are great for this.

K. Select Appropriate Renewable Energy

L. Design with Recycling

Always choose local and bioregional sources for selections first. Barter and trading systems are and common now in many parts of the world. Take the time to locate and be an active member of them. You can be clever about using recycled materials.

Put it on Paper

1. Create Bubble Diagrams

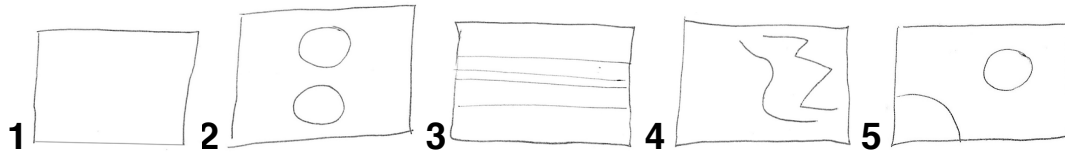
On at least three copies of your base map draw round shapes with words in them showing rough placement of the use areas on your map. Connect these shapes with lines to show the paths between these elements. The shapes need to be roughly to scale. The shapes will show placement of your “outdoor rooms” or use spaces. The lines will show the connections of these rooms, your paths. Do these fast and loose. Use the concepts of zones and sectors to help you with placement. Colored felt tip markers are good for this. You can do as many of these as you want. Each new design will bring new ideas. Sometimes I make 2D models to scale of the furnishings I want to place in these outdoor rooms and cut them out of colored paper. I can move them around before gluing them where I want them. This helps me stick with scale and experiment with placement. Have fun!

Combine your best ideas from your bubble diagrams into one master bubble diagram that will be refined into your design. This diagram will have improved flows, stacked uses, and better scale.

2. Create your Final Design

Forced Perspective

The forced perspective technique manipulates our human perception with the use of optical illusions to make objects appear larger, smaller, farther, or closer than they actually are. These techniques are very helpful to make a city lot appear larger. Artists have used this “perspective of the eye” for centuries to create the illusion of depth. We can use them with real depth to make a small piece of land appear larger.



1. When there is nothing on a plane there is no illusion of depth.
2. When something is placed higher on a plane the higher object appears further away.
3. When horizontal lines are stacked on a plane they appear further away as they go to the top of the plane.
4. Curved, straight or zigzag lines at an angle on a plane lead the eye into an illusionary distance.
5. A larger or part of an object lower in a plane with a whole object else where in the plane makes the whole object appear larger. The traditional landscape schools used parts of a tree to show close and a whole tree to show depth. This is called the “tree formula”.

Ideas to assist placement choices

- Pattern can help to make a small area feel more spacious.
- The most beautiful places need to be protected. Where are they?
- Where will you put places to read, rest, visit, eat, cook, store, play, work, wash, bathe, play music, plug in, hide, mediate, or exercise?
- You need a place to sit with your back to a wall on a south side, sheltered from the winter sun.
- Construct well-protected entries.

- Use side yards for seating, and water harvest, if you have the room.
- Have sunshine and light, shadow and light, airflow, protection from sounds, privacy, protection from smells, and soft surfaces – unless intentionally creating a barrier (then make it prickly).
- Design for insects, birds, and other animals.

Take time to lie out your final drawing so it will look good on your page. It will include your design drawn over a copy of your base map. You can do the type on your computer and copy it through tracing paper or paste it on your drawing. You can paste photos of plants, furniture, or art on the page to dress it up and help show what you want to communicate. Sometimes it is helpful to create separate hard surface and plant drawings. I use overlays to do utility details. You can list plants, including sizes, and surface materials, including amounts, on separate sheets of paper. You can make a black-and-white copy and color it with pencils, felt-tip pens, watercolor, or oil pastels (or any combination of these). Whatever. Have a good time with it.

Sometimes I use photos of the site that I alter with whiteout, colored pencils, and oil pastels to show how I want the final result to look.

How Nature Works, Guiding principles of the Designer:

- Everything is connected to everything else
- Every function is supported by many elements; e.g. guild, soil
- Every element can serve many functions; Elements are placed in relationship to another so that they assist each other or make the least change for the greatest possible effect
- The edge is the most productive area in a natural system; you increase productivity (creativity) by increasing edge
- Diversity is related to stability. It is not, however, the number of diverse elements you can pack into a system, but rather the useful connections you can make between these elements
- Nature abhors a vacuum
- A healthy system will tend to correct its own minor imbalances if allowed to do so

Permaculture design asks the question, “Where does this (element) go? How is it placed for maximum benefit in the system?”

Permaculture is made up of techniques and strategies:

- **Techniques:** concerned with how to do things (one-dimensional), e.g., organic gardening
- **Strategies:** concerned with how and when (two-dimensional), e.g., Seed Balls, Organic Gardening with Seasons
- **Design:** concerned with patterning, time, placement, selection, ascetics (multi-dimensional)

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