Permaculture

Moving towards a sustainable society

Objectives

This module is meant to simplify and provide examples for the different aspects of Permaculture, its ethics and principles. It will direct you to media from all over the web, so think of this as a springboard to help you find knowledge; something better than just googling 'permaculture'.

Terms

Functions - work done by elements; conversion of chemical energy, transportation of resources, energy storage, beautification, or elimination of work altogether.

Element - The cause or effect of a function. These can be organisms, machines, buildings, tools, or landscape features.

Resource - any material that is regenerative or replaced in some way over time. As opposed to a source which is not restored over time

Intensive - Something that is complex, information rich and full of energy.

Some Background

Bill Mollison and David Holmgren coined the term "Permaculture" in the mid-1970s as a contraction of *Permanent* and *(Agri)Culture*. The philosophy arose as a direct response to the perceived degradation of ecology, culture, and health in the last century that result from the extractive and controlling processes of industrial society.

The founders of Permaculture

They are both educators and practitioners, and the founders of permaculture as a movement. Each represents a portion of permaculture practice.

- Mollison takes care of the practical side of things. His books are more of a how-to for agricultural practice and are informative and eye-opening. Farmers focus mainly on his work. Much of this module was gleaned from his *Introduction to Permaculture*, which is free http://tcpermaculture.blogspot.com/2013/02/free-e-book-introduction-to.html.
- Holmgren defines the overarching principles of permaculture. His writings are more applicable to society as a whole; to consumers, business people, scientists, governments, and workers. His work is more thought and discussion provoking.

Other Prominent Permaculturalists

- **Masanobu Fukuoka** - Website and Free PDF of The One Straw Revolution(his book that really started it all)
- **Sepp Holzer** - Website , Documentary , Free PDF
- **Toby Hemenway** - Website
- **Geoff Lawton** - Website , he also has an abundance of youtube videos
- **Joel Salatin** - Website
- **Patrick Whitefield** - Blog
- **Maddy Harland** - Editor of Permaculture Magazine
- **Mark Shephard - Author of Restoration Agriculture**

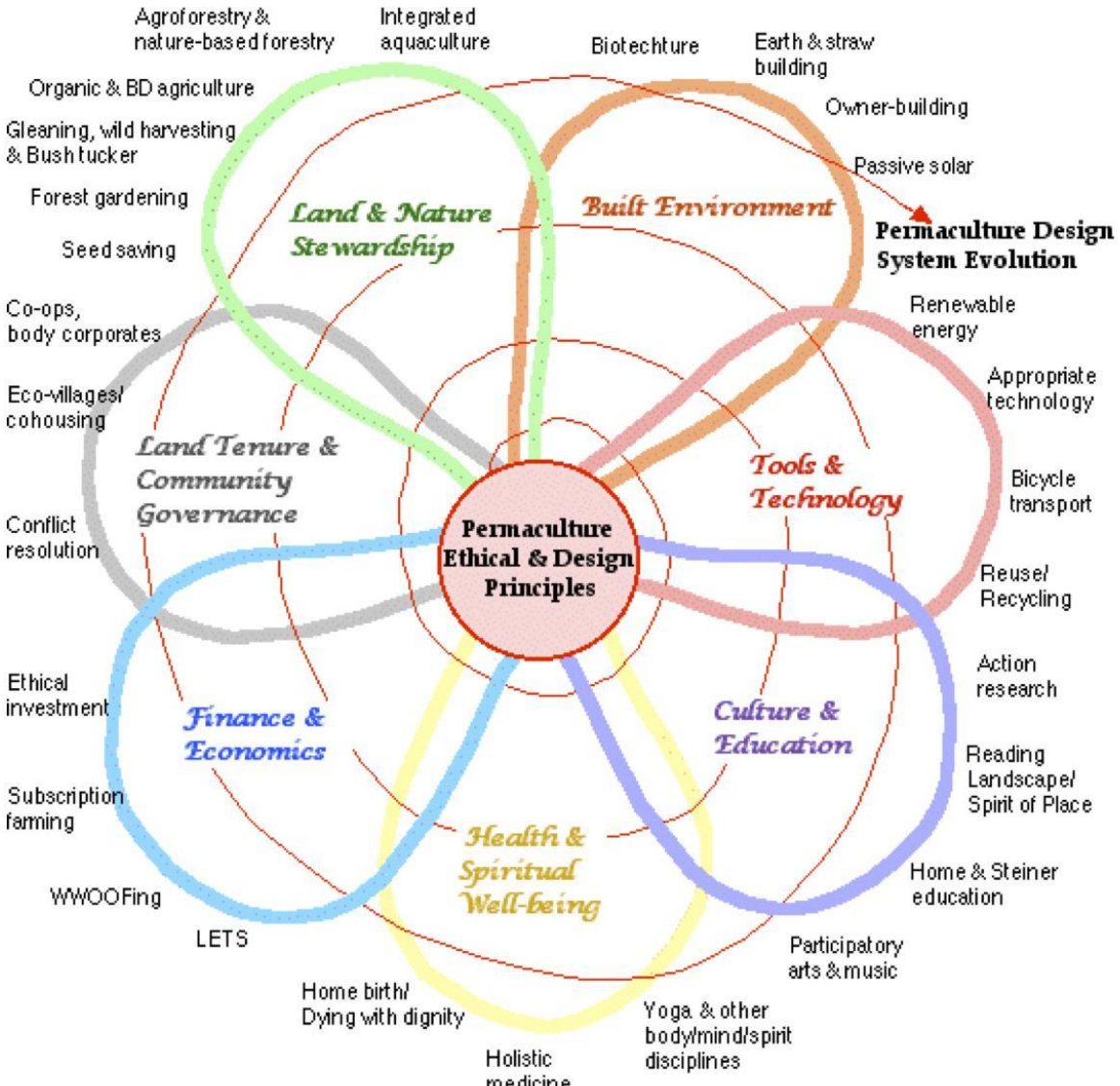
One Definition of Permaculture

- It is a *method* of thinking for designing any system. For some, this extends into systems of culture, belief, business, economics, and ethics.
- Ideally, it is not value based, but evidence based. As in the sciences, the theories and principles are backed by testable evidence found in the natural world. Physics, chemistry, biology, math, economics, government and art all have an equal place in permaculture and vice-versa. Permaculture is about applying information to the design of sustainable systems.

This Blog Post consolidates multiple definitions from leaders in the field. It takes an entire book and years of experience to adequately define permaculture, so it is best to read many definitions as well as write your own.

The Permaculture Flower

Starting with ethics and principles focused in the critical domain of land and nature stewardship, permaculture is evolving by progressive application of principles to the integration of all seven domains necessary to sustain humanity through energy descent.



The focus here is on Permaculture practices relating to Agriculture.

The ***philosophy*** of permaculture is made up of twelve guiding principles. They are elegantly outlined with examples here. These principles were largely developed and written about by David Holmgren, however they are more theoretical and harder to apply directly to agriculture. In this unit, we will be outlining the practical principles of permaculture ***design*** developed by Bill Mollison with relevant examples in agriculture.

A quick list of Design Principles -

1. Relative Location
2. Each element performs many functions
3. Each function is supported by many elements
4. Energy Planning
5. Using biological resources
6. Energy Cycling
7. Accelerating succession
8. Value Diversity
9. Design Small scale and intensive systems
10. Use edge effects
11. Attitude

The Chicken as model

In the following slides, we will be discussing each of the Design Principles, focusing on the Chicken as our model element. We will describe each Design Principle, and then follow by one or more examples that integrate the Chicken element.

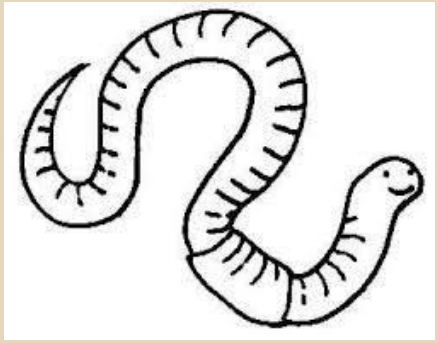
1. Relative Location

This is the core of design. Each element in a system has inputs and outputs(materials); we should locate them *relative* to each other so that materials flow into one another. Relationships between elements are fundamental to the workings of nature, so we should strive to connect the elements of our farm in a way that forms a relationship. We want to make moving materials easy and sensible, allowing energy to flow along the path of least resistance.

1. Relative Location

The kitchen garden loop

Where can we put our chicken??

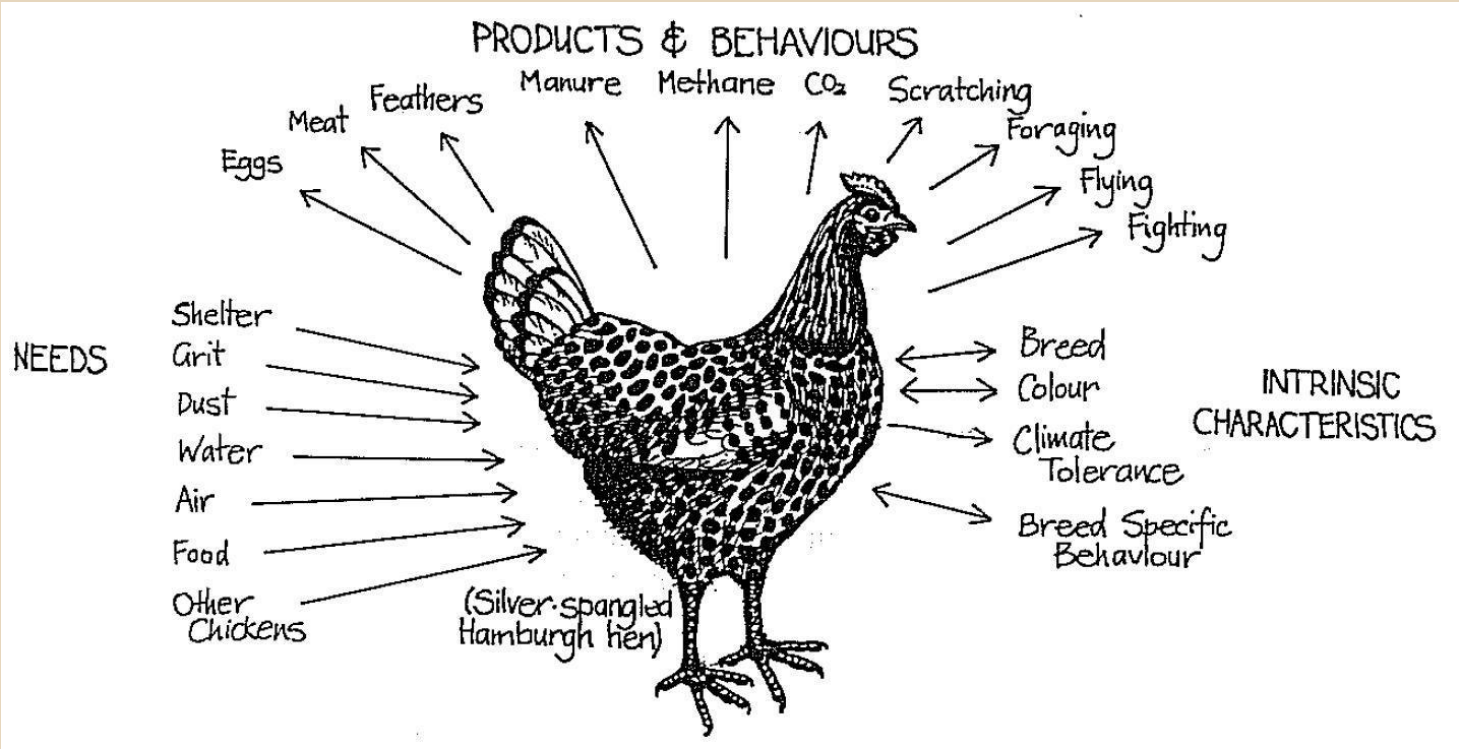


1. Relative Location

A worm composting setup for scraps located between the kitchen door and the vegetable garden allows nutrients to flow easily from table to worms to soil and back to table. Our model element, the chicken, could consume worms that have been feeding on the scraps. These worms can either be given as feed to the chicken at a different location or, if the chicken is allowed access to the worm composting area, in scratching for worms, the chicken turns over compost & scraps, consuming some of the scraps directly; excreting nutrients via chicken manure which add to the available worm food. This is an example of placing one element into an appropriate space between other elements for added products (in this case eggs!)

2. Each Element Performs Many Functions

Everything is multipurpose with a little information and imagination. Every aspect of an element affects how it functions.Our chicken has many elements and functions associated with it. How will we use each of these to our benefit?



2. Each element performs many functions

The Chicken:

Forages on invasive plant seed and insects, **suppressing pests**

Converts its food into **fertilizer and food for us**

Cultivates the ground by searching for food

2. Each element performs many functions

This element, the area between the curb and sidewalk has several functions: beauty, insect habitat, plant diversity, soil building and forage.

3. Each Important function is supported by many elements

Pests are suppressed by: chickens, allelopathic plant diversity, wildlife, healthy soil, our intervention

Our food is created by: chickens, crop plants, decomposers in soil(releasing nutrients), compost biology

Land is cultivated by: our implements, our animals(chickens), earthworms, deep rooted plants

4. Energy Planning

Energy planning involves taking your entire land area into account and developing different Zones based on the amount of time/work/input required to manage it. The areas with the highest requirements are near the house (zone 0) up to an unmanaged area (zone 5) used for observation only. We also consider the natural features of the land(contour, vegetation, aspect, weather patterns)

4. Energy Planning

Zone 0	The homestead or home centre. Permaculture principles are applied here to create a sustainable area in which to live and work.
Zone 1	Fully irrigated garden. Personal and household elements which require frequent attention and visits.
Zone 2	Orchards (irrigated) and small livestock. Business and community elements.
Zone 3	Commercial crop, sown pastures and plantations (unirrigated), dams and large livestock. Bioregional elements.
Zone 4	Managed rangeland, forests and wetlands. National/Continental elements.
Zone 5	Untouched wilderness. There is no human presence here, except to observe ecosystems and natural characteristics. Global elements.

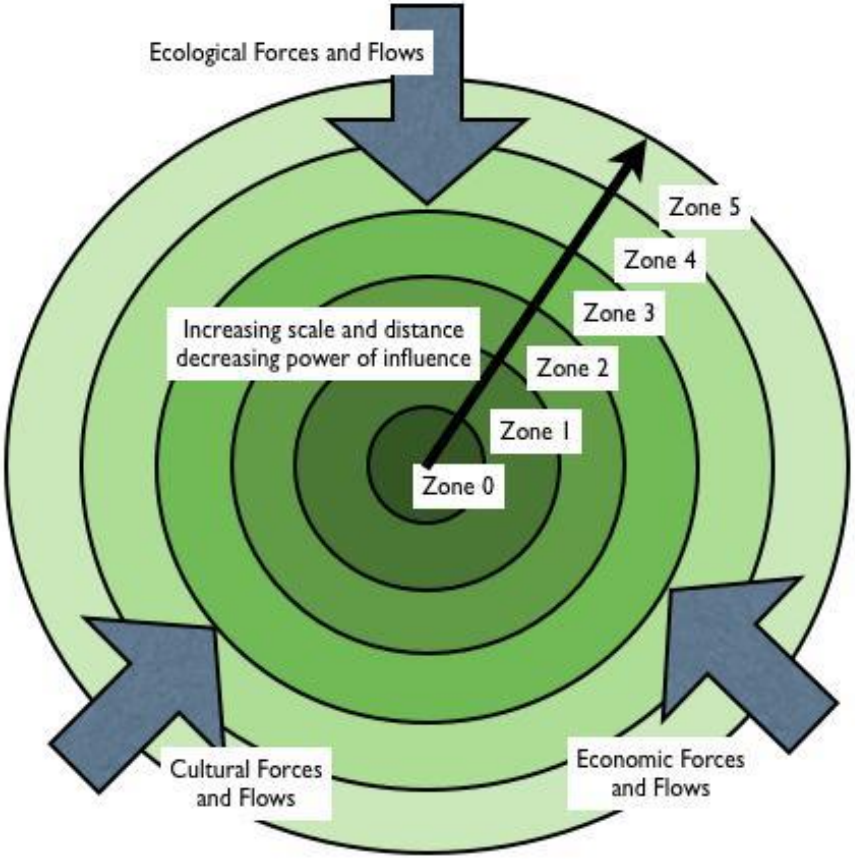
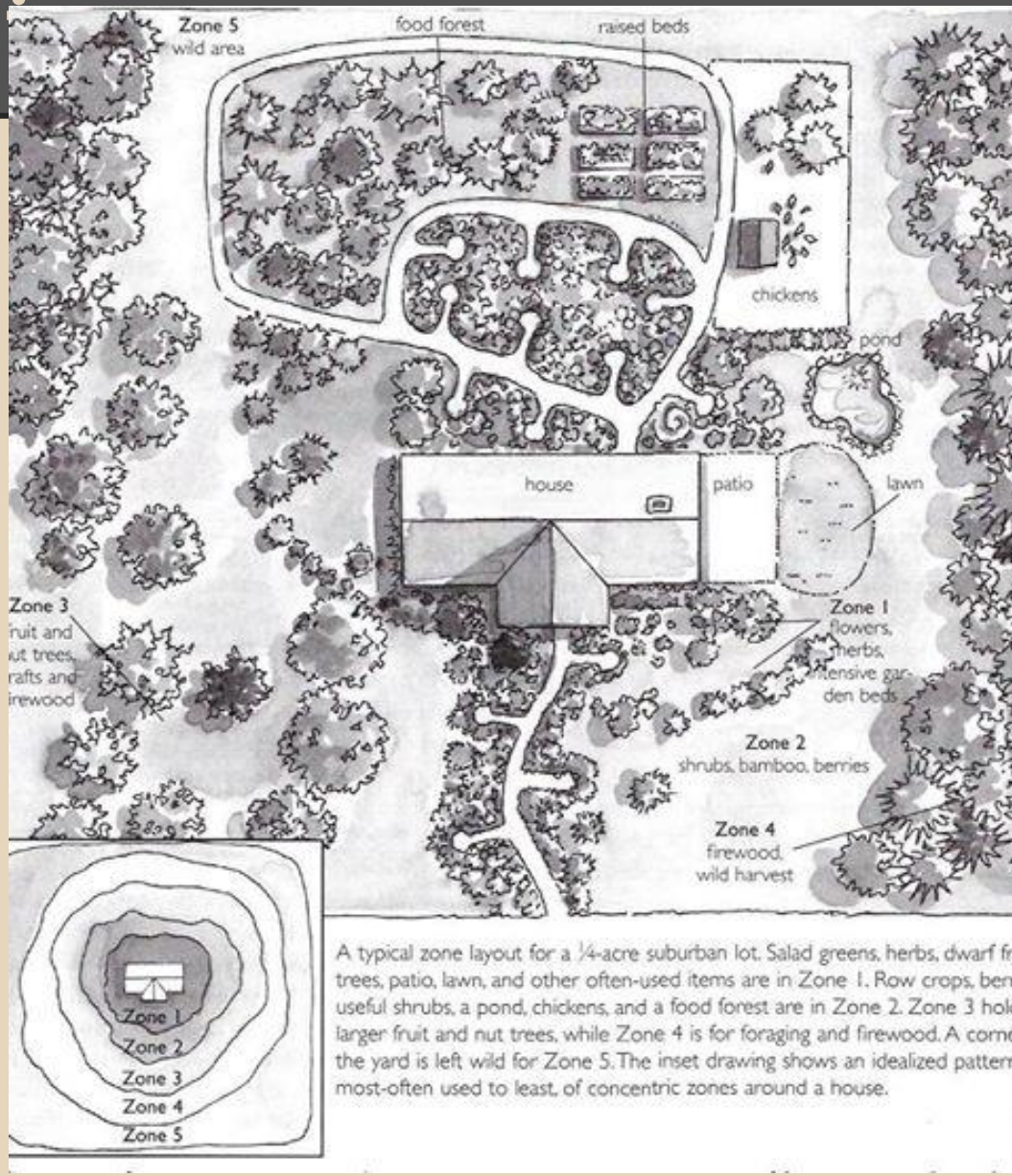


Figure ?. An illustration of the permaculture zone concept together with a table of conventional zone definitions based on site design at a small scale, and on conceptual social connections. Diagram and table were imitated from Holmgren (2002, p. xxvii, p. 139).

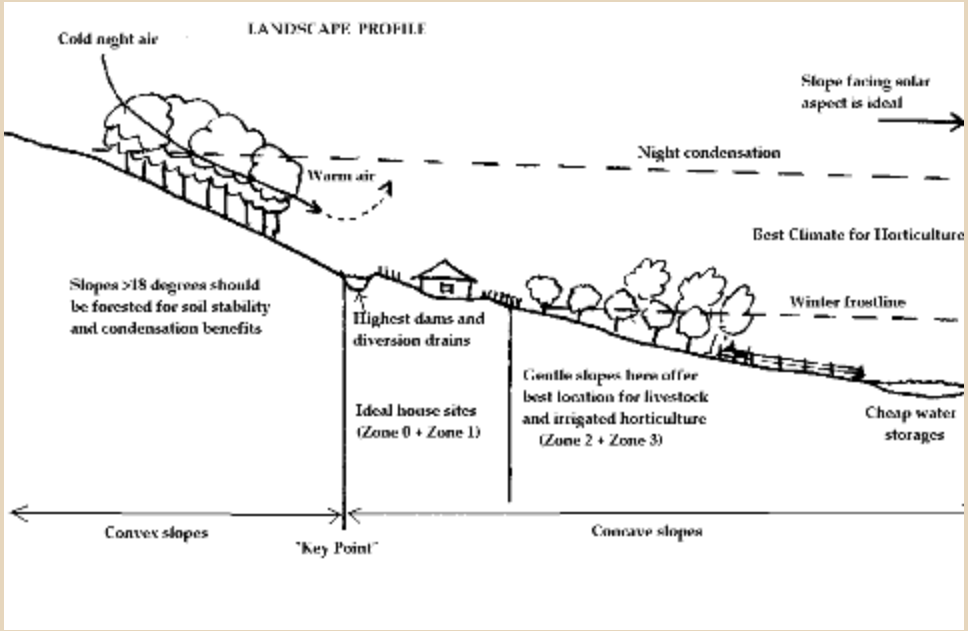
4. Energy Planni

Chickens are located along the daily path, near the house to make caring for them easy and natural. This is design for sectors of land.



4. Energy Planning

We also need to consider slope and contour of the land in profile. These will play a big role in how energy flows naturally. We want to work with this natural flow.



5. Use Biological Resources

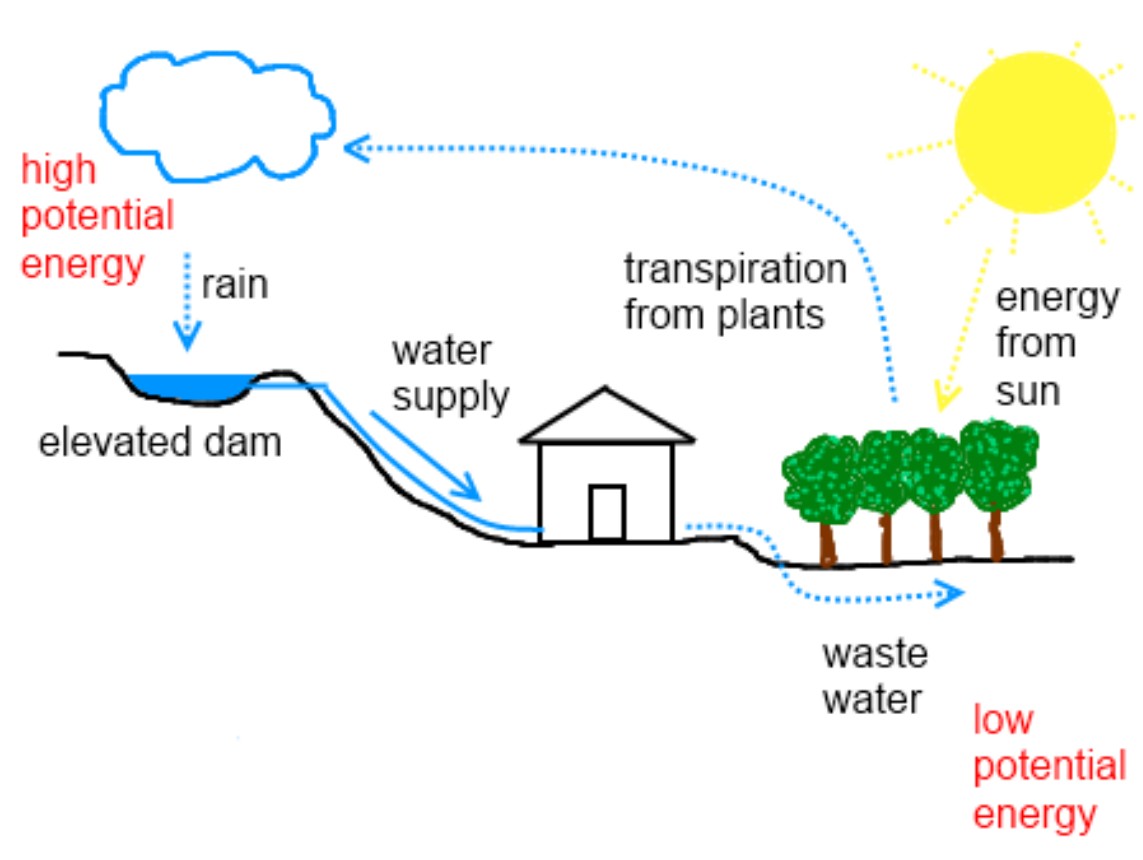
All land has resources present and a careful eye can identify these. These come mostly in the form of plants and microorganisms. Get a field guide and survey your land for useful and edible things.

Hedgerows are often overlooked, but highly useful. Chickens like to nest in this habitat. In the previous slide, we could pen the chickens in a long run on the sides instead of using valuable central space.

6. Energy Cycling

Our food system relies on massive scale extraction of energy(fossil fuels, fertilizers) from the earth. It is a linear sequence of energy transfer that depletes our resources more quickly than they can regenerate. Permaculture seeks to transfer energy in cycles that build resources over time. We must seek to capture and cycle all energy coming through the land. Instead of relying on the manufacture and transport of chicken feed, we seek to provide food on site by planting and encouraging diverse life. Whatever we take, we must return.

6. Energy Cycling



7. Small-scale intensive systems

Small systems require less energy to run and we can stack more of them on a site for diverse yields. Intensive systems rely on lots of information to get them running efficiently, but run by themselves if properly set up. Instead of broad-scale approaches like planting 2000 acres of monoculture, we begin at the area closest to our living space and develop it to a point where it is functioning well with minimal input. We want to maintain control over our environment with as little energy as possible.

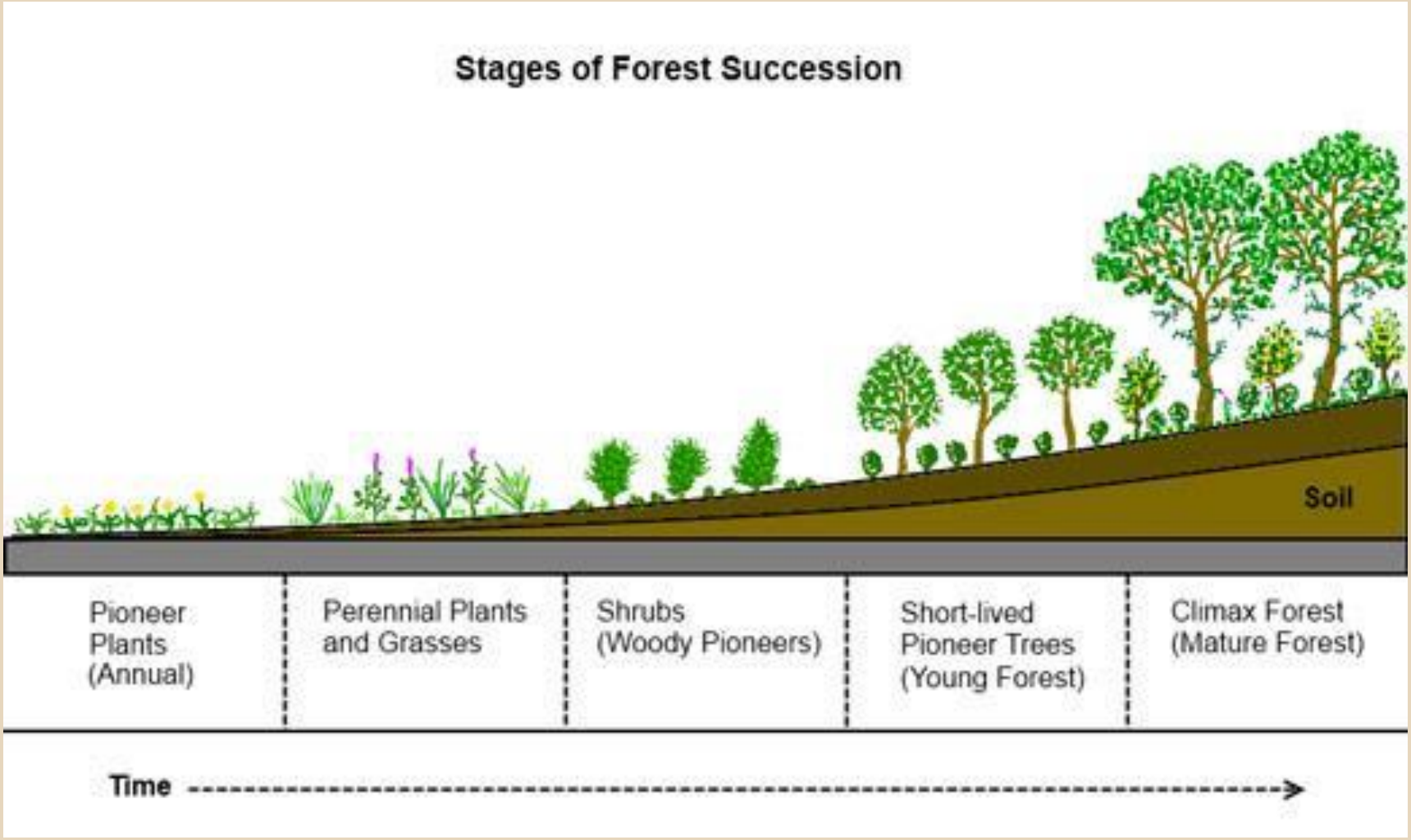
7. Small-scale, intensive systems

- Sepp Holzer's Krameterhof is a great example of how much potential lies in small holdings.
- For chickens, we wouldn’t want to start off with a massive flock even if we have done extensive research. Starting small and really getting to know them will pay off when the time is right to go into larger production

8. Accelerating succession

We understand how stable biological systems are built over time in nature. We can mimic this process successfully and quickly through permaculture design. The goal of permaculture is to build stable ecosystems that produce a yield, usually in the form of multi yielding food forests. This article describes in detail the ecological basis of succession.

8. Accelerating Succession



8. Accelerating Succession

The chicken is best introduced in the young forest stage, where it has perennial ground cover to brood in but also low shrubs in which to roost. Young forests also have abundant insects and seed production.

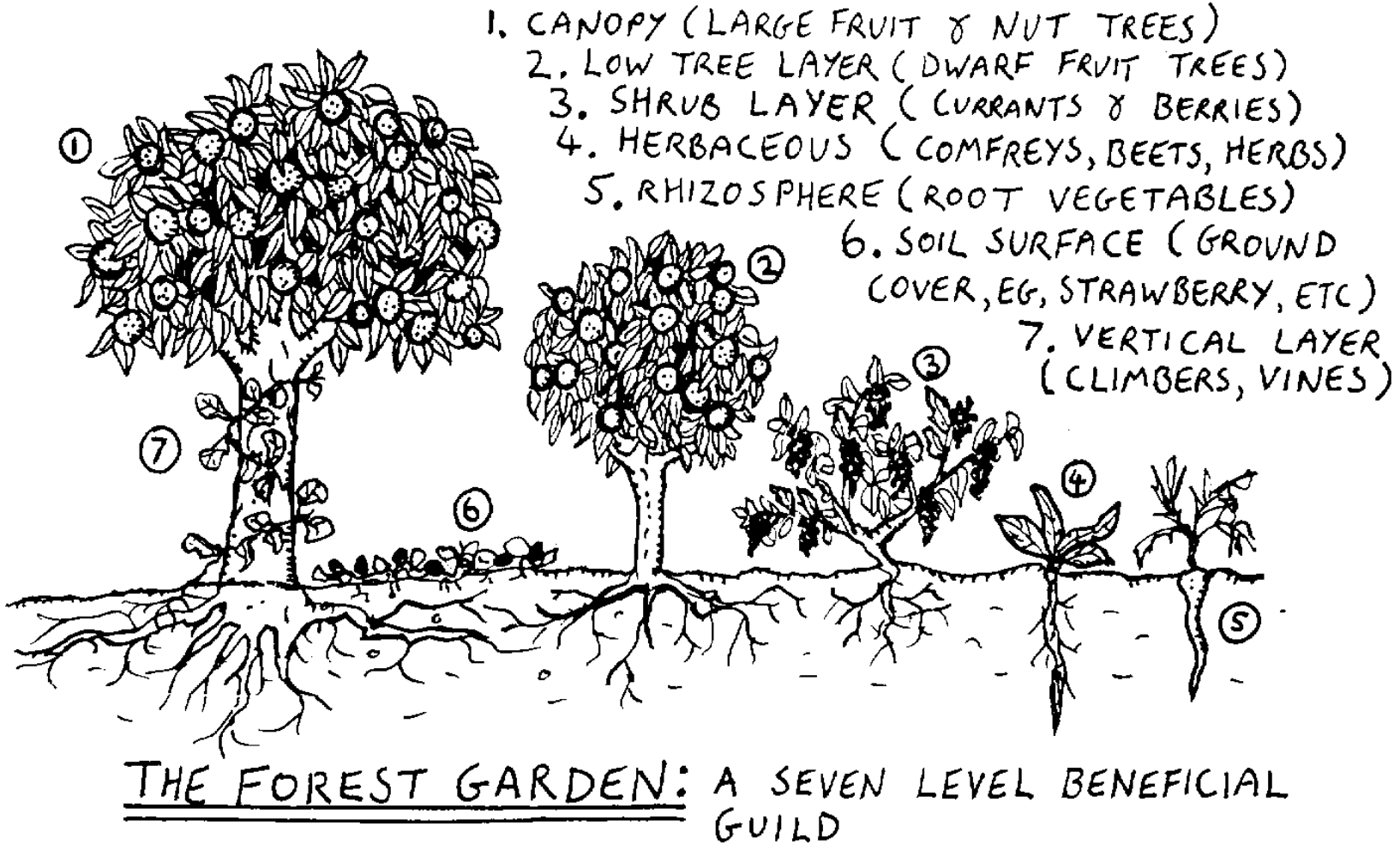
9. Diversity

Diversity is natural and stable. It allows change to occur without detriment and increases production over time. Plants, animals, insects and microbes all work and compete together to form the beauty that we call nature. Knowing the habits of a variety of organisms will allow you to place them together in a system so that they complement one another. This is called a guild because the organisms create an environment allowing for the existence of more complex and abundant forms.

9. Diversity

- Pastures interplanted with trees have been shown to be as productive for grazing as treeless pasture with the added benefit of shade, fruit, nut, or fuel production.
- Our chicken will do best not with a high quality bag of feed and a hut to sit in, but within a guild of bugs, plants, and microbes. It should have plenty to eat and a mosaic of environments to live in. If one type of food or shelter is scarce, there are others to rely on.
- Birds are an important piece of farm diversity. Everything gardens, or has an effect on its environment.

9. Diversity


1. CANOPY (LARGE FRUIT & NUT TREES)
2. LOW TREE LAYER (DWARF FRUIT TREES)
3. SHRUB LAYER (CURRANTS & BERRIES)
4. HERBACEOUS (COMFREYS, BEETS, HERBS)
5. RHIZOSPHERE (ROOT VEGETABLES)
6. SOIL SURFACE (GROUND COVER, EG, STRAWBERRY, ETC)
7. VERTICAL LAYER (CLIMBERS, VINES)
THE FOREST GARDEN: A SEVEN LEVEL BENEFICIAL GUILD

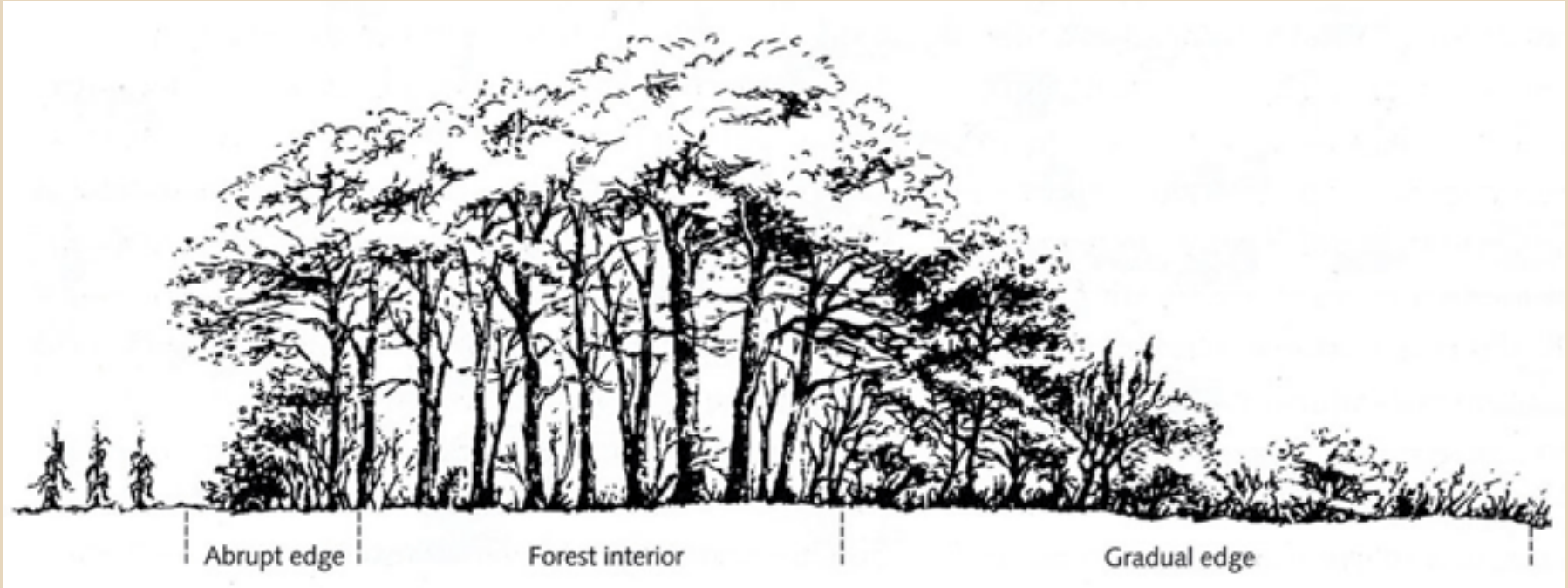
10. Edge Effects

Edges are the interface between two mediums where energy flows back and forth. Life exists as the effect of this flow. Diversity is therefore higher at the edge than in the middle of an area of evenness, where energy is easily immobilized.

The importance of edge

10. Edge effects

This is a diagram only, but you can see the same effect present in nature. The density and diversity of vegetation is highest at the interface between forest and grassland.



11. Attitudinal Principles

Failures are learning opportunities. The negative effects of failure are minimized if we ask the right questions and learn from the mistake.

Experimentation gains you experience, which is necessary to finding the best way to do things.

Every site has an abundance of resources in place in the form of wind, water, rocks, weeds, and wildlife. These resources become obvious with access to the right information

Creativity is the biggest limit to the effectiveness of design.

Chickens are destructive to the ground when penned in densely. If this is our only option, we can use it to our advantage such as clearing ground for planting by penning them in movable structures.

Exercise

Evaluate the aspects of the following 3 site plans.

-Which one would you pick as the most effective?

-What would you change about it?

-Does the plan follow our guiding principles?

Chicken Run Deer Fence (See Detail)
Removable Barrier
Comfrey + Siberian Pea Shrub
N
1" = 15'
Vegetative Deer Fence
chicken run
Compost
chicken Slaughtering
Espalier fruit trees
Tall
Berries + Shrubs
Solar Trap
Short
Comfrey Green 'Manure' Garden
Potato Boxes (See Detail)
Wild
Berries
Half Moon Garden
People Food
Flowers
Keyhole Gardens
Trellis
- Hardy Kiwi
- Grape
Deer Fodder
open
Patio
Rainwater Collection
Berries
- Blueberry
- Raspberry
Toolshed
Food Processing
Greenhouse
Herbs
Herb Spiral
Wild
open
1
2
3
4
Jean Pain Mound
Orchard
Ash
Espalier Fruit Trees + Nut
Deer Fence
Snow and vehicles
Exposed Ledge
Access
Apple, Pear + Hazelnut
- Comfrey, Camas, Bergamot, Yarrow, Alliums + Echinacea
Orchard Community
- Apple, Plum + Pear
- Seaberry + Elderberry
- Comfrey, Clover, Garlic chive, Camas, Dill, Fennel, Yarrow, Bergamot, Nasturtium + Chickory
Ledges for:
- Walking
- Sitting
- Reaching Fruit

PERMACULTURE DESIGN FOR SABINA HOME

LARGE VEGETABLE GARDEN, LARGE ORCHARD (BOTH ZONE 2), STAPLE CROP AREA (ZONE 3) & WOODLOT (ZONE 4)

OCTOBER 2008

SCALE 300:1
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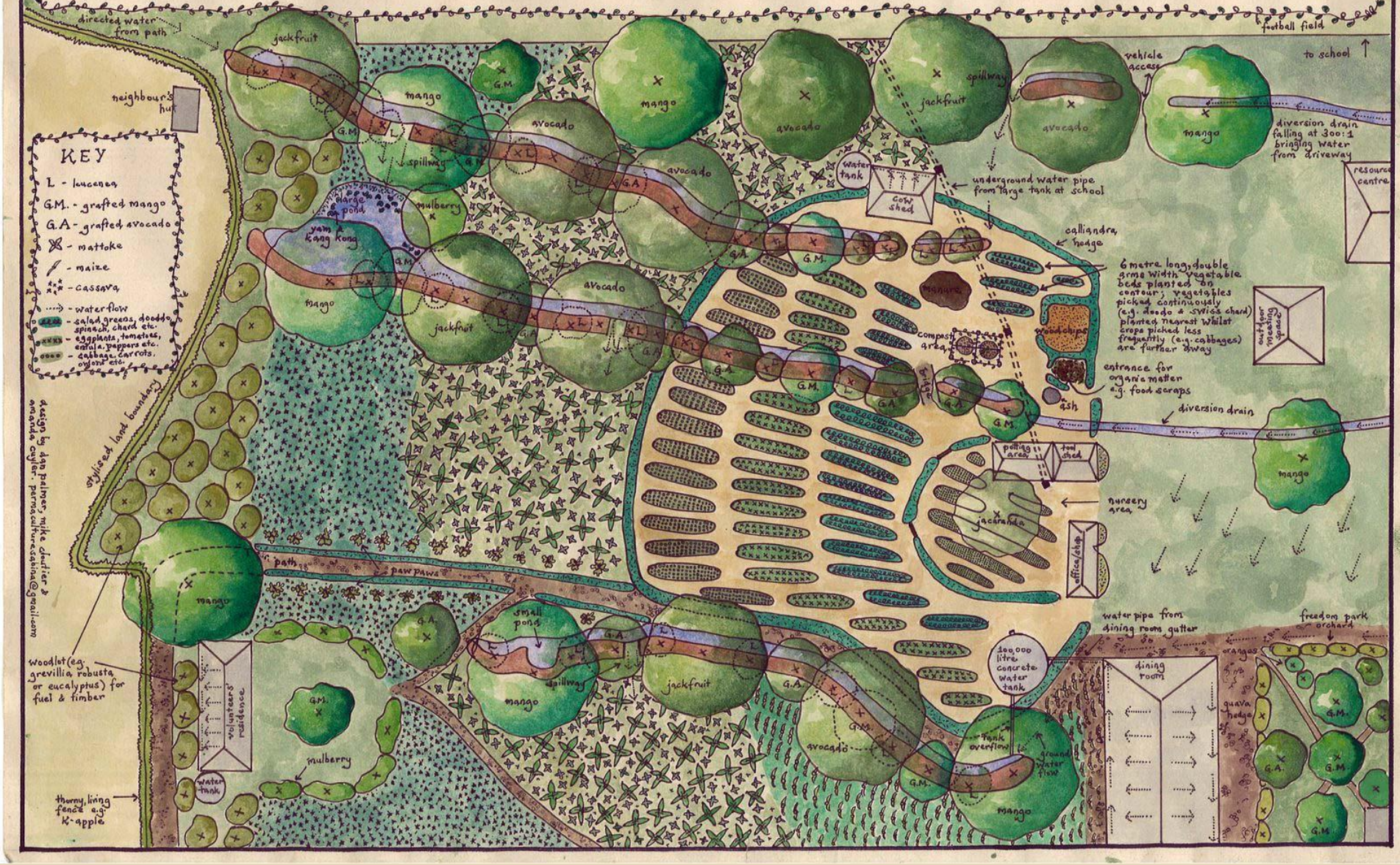


fruit tree
red twig dog wood
cornus sericea
lg. berry shrub 6-8'
sm. berry-3-4'
siberian iris
iris sibirica alba
hops vine
humulus
raised garden bed
ground cover
carex "lawn"
forest garden
gravel/patio
Site Plan
1"=100'-0"
FRONT SETBACK TO LIVING SPACE
23.2'
FOUND CROSS TOP OF CURB
5' SIDEWALK
19" OAK
23" OAK
125.96'
75.00'
Area A
Area B
NORTH

Self Review

- What are benefits of permaculture for the farmer? For the environment?
- What are the basic principles of permaculture?
- How can your farming plans include more permaculture aspects?

Resources

- Books, Articles, Web Resources by Bill Mollison
- Books, Articles, Web Resources by David Holmgren
- http://midwestpermaculture.com/
- http://www.permaculture.org/