

OSU Master Gardener Training 2018

PERMACULTURE BASICS FOR MASTER GARDENERS

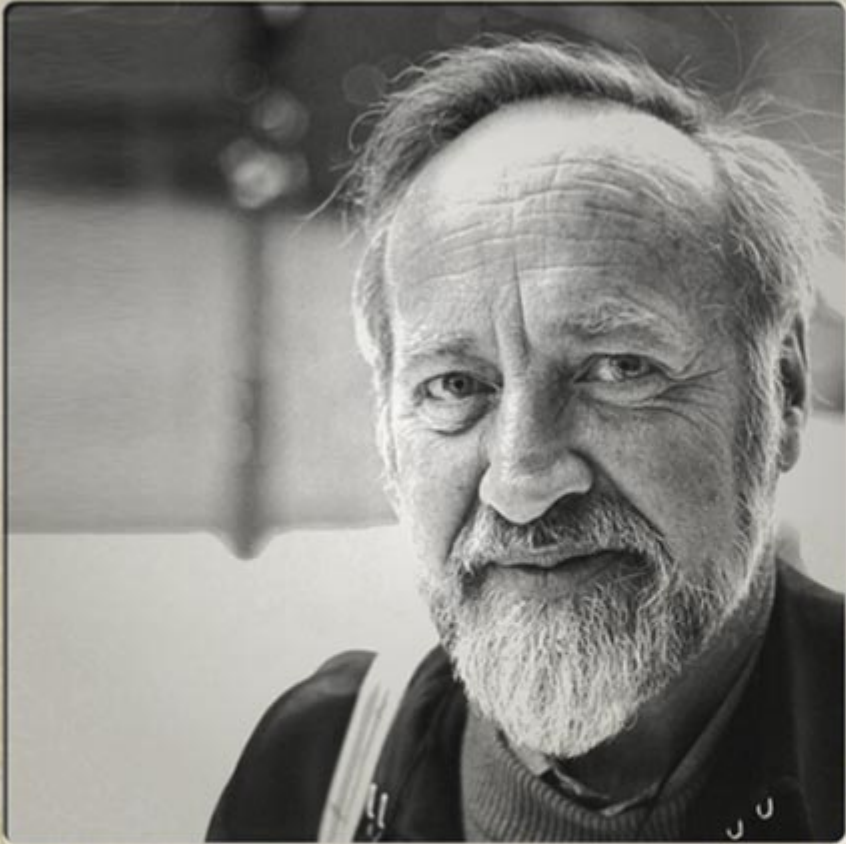
Michelle Sager
OSU Extension Service, Wasco County



Oregon State
University

Learning Objectives

1. Understanding of foundations of Permaculture
2. Examples of Permaculture design techniques for backyard gardens
 - a. Including some controversial ideas in Permaculture
3. Familiarity with at least one Permaculture design principle
4. Practice at designing / applying principles



Bill Mollison



David Holmgren

What is Permaculture?

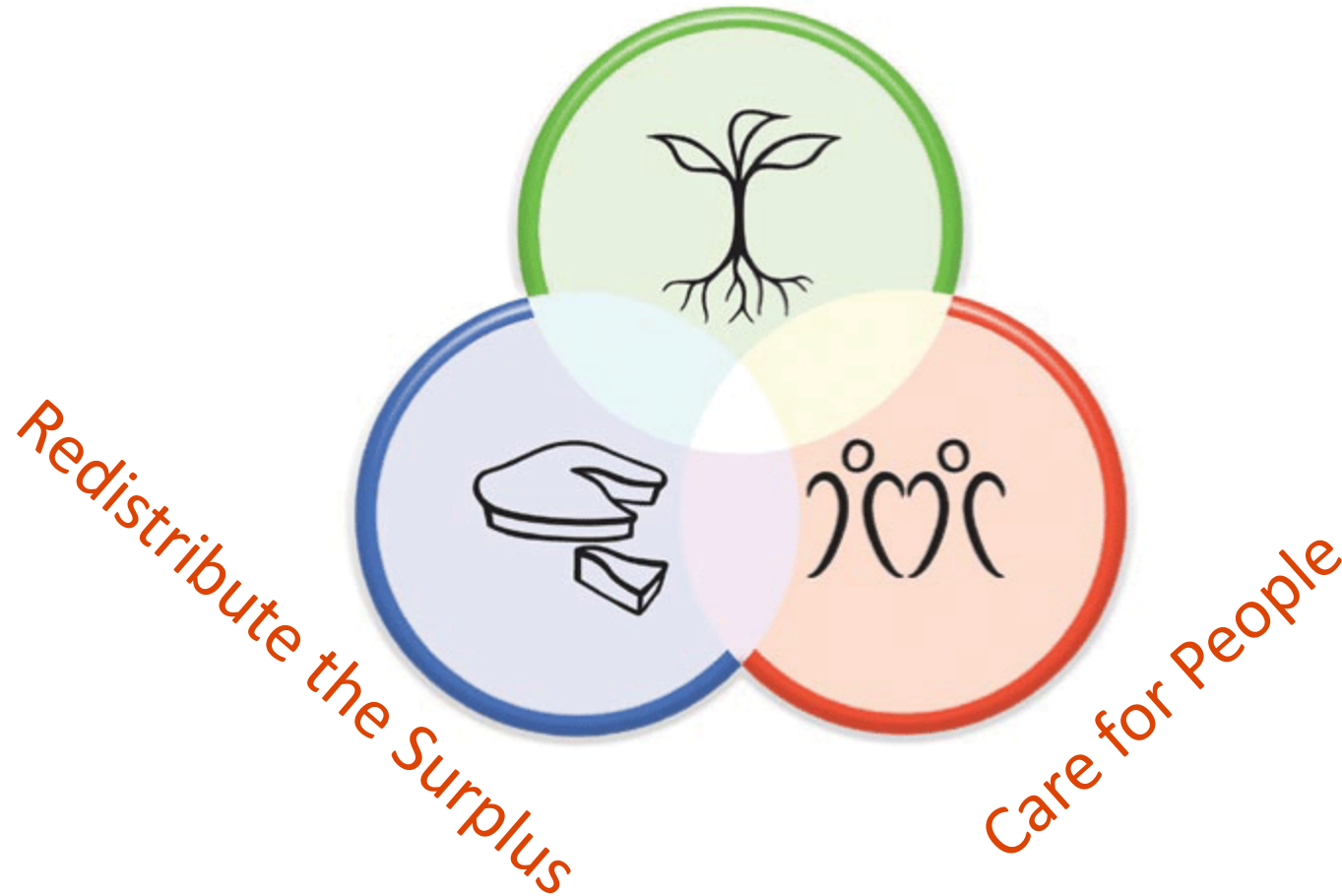
What is Permaculture?

Permaculture is most often used for creating efficient and productive landscapes that sustain themselves into the future by regenerating biodiversity and lost fertility.

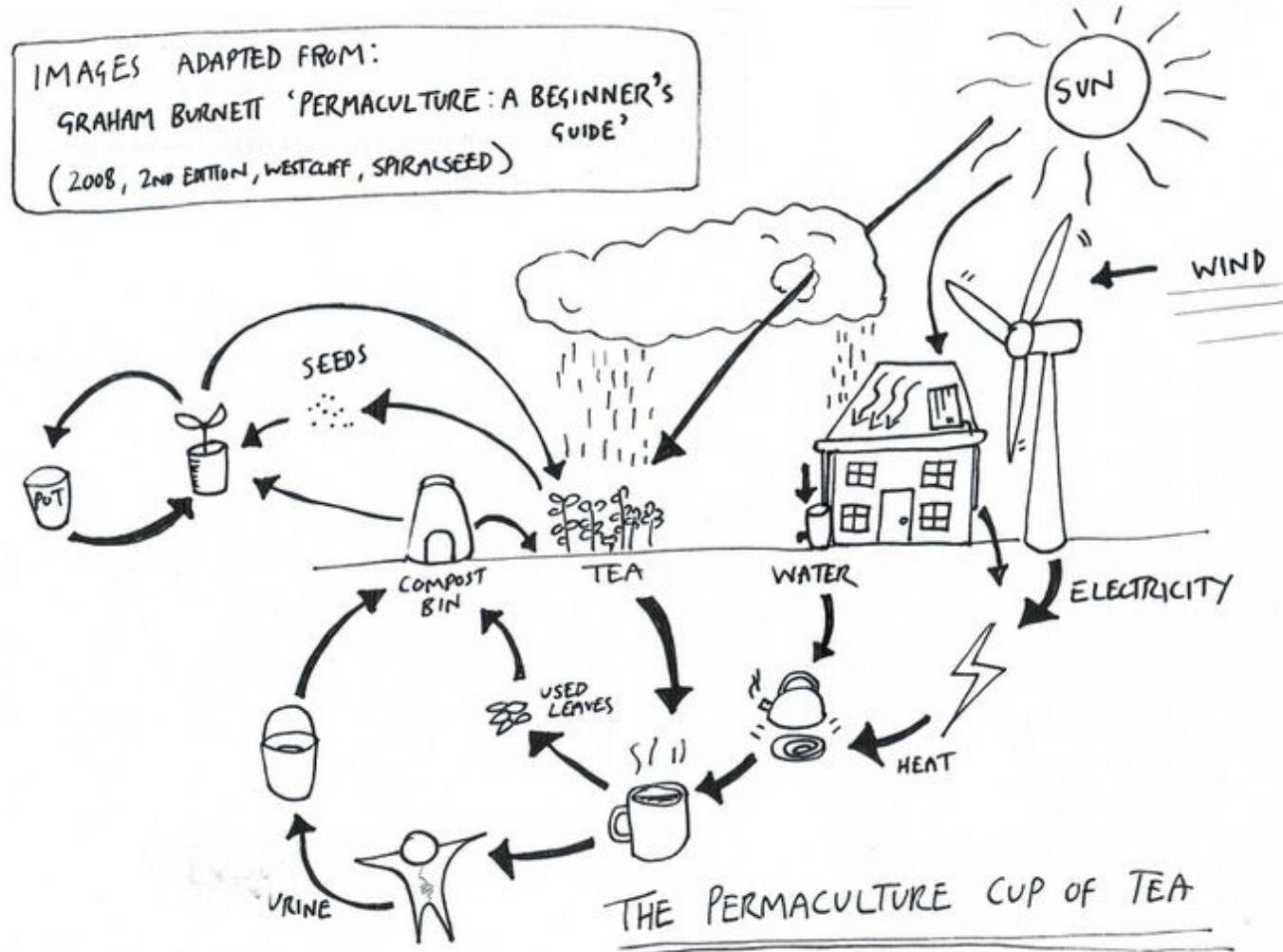


Permaculture Ethics

Care for the Earth



Philosophy + Design

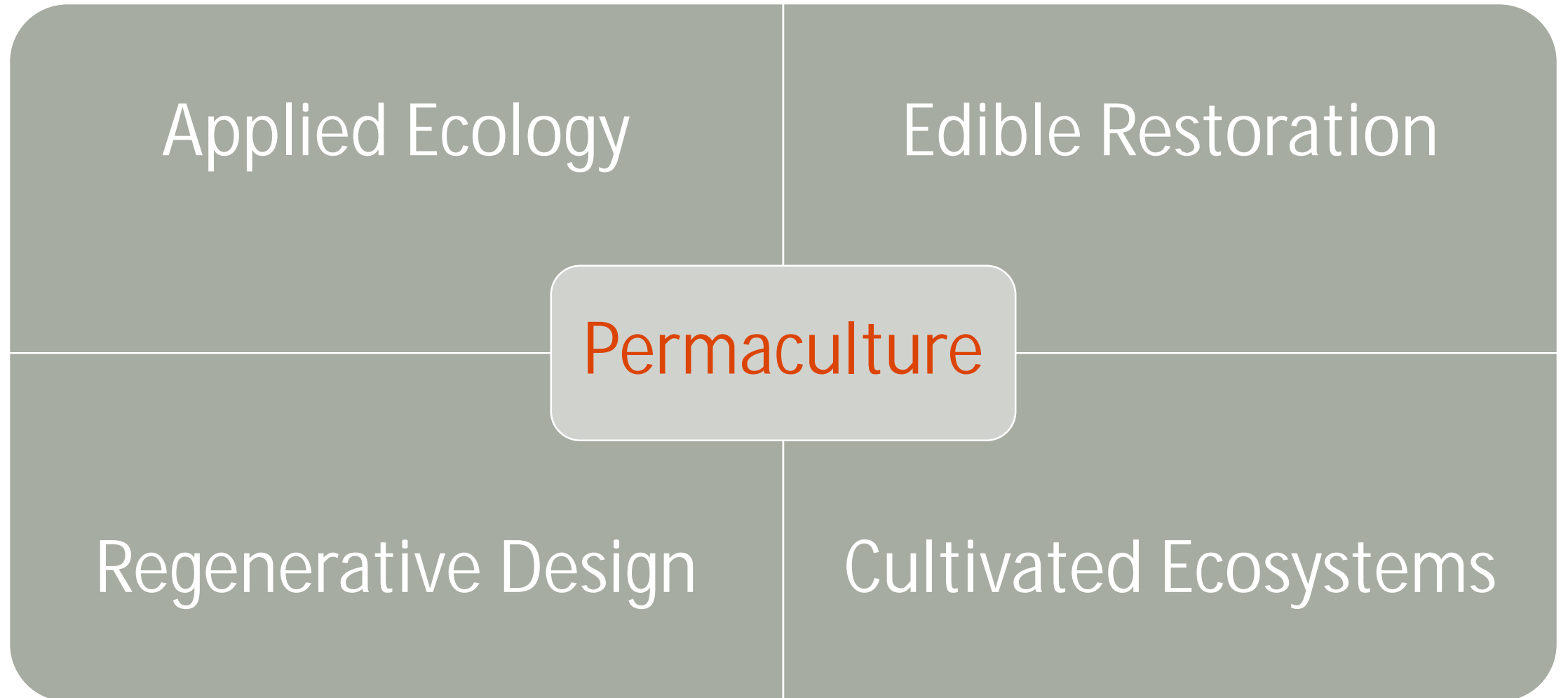


What is an Ecosystem?



A system, or a group of **interconnected** elements, formed by the **interaction** of a **community** of organisms **with their environment**

Philosophy + Design

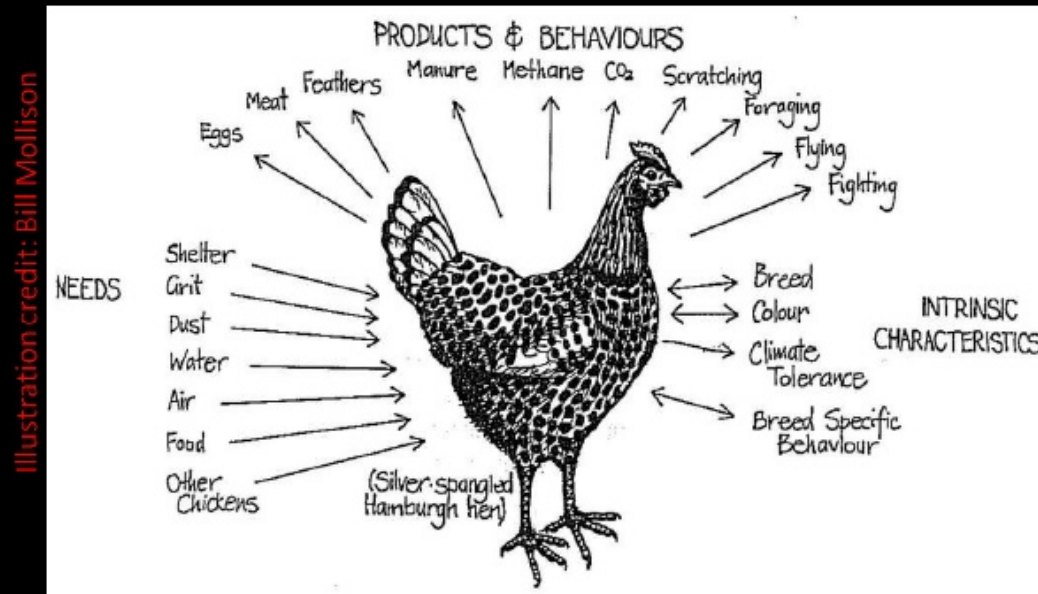


“Permaculture Design is not the rain, the roof, or the garden. Permaculture Design is the connections between these things. Permaculture brings cohesion where there was once isolation.”

-Bill Mollison

Inputs and Outputs Activity

Needs & Yields: The Permaculture Chicken



What does each element need in order to live or be maintained?

What products or services does it naturally provide?

“You don’t have a snail problem...
you have a duck deficiency!”

- *Bill Mollison*

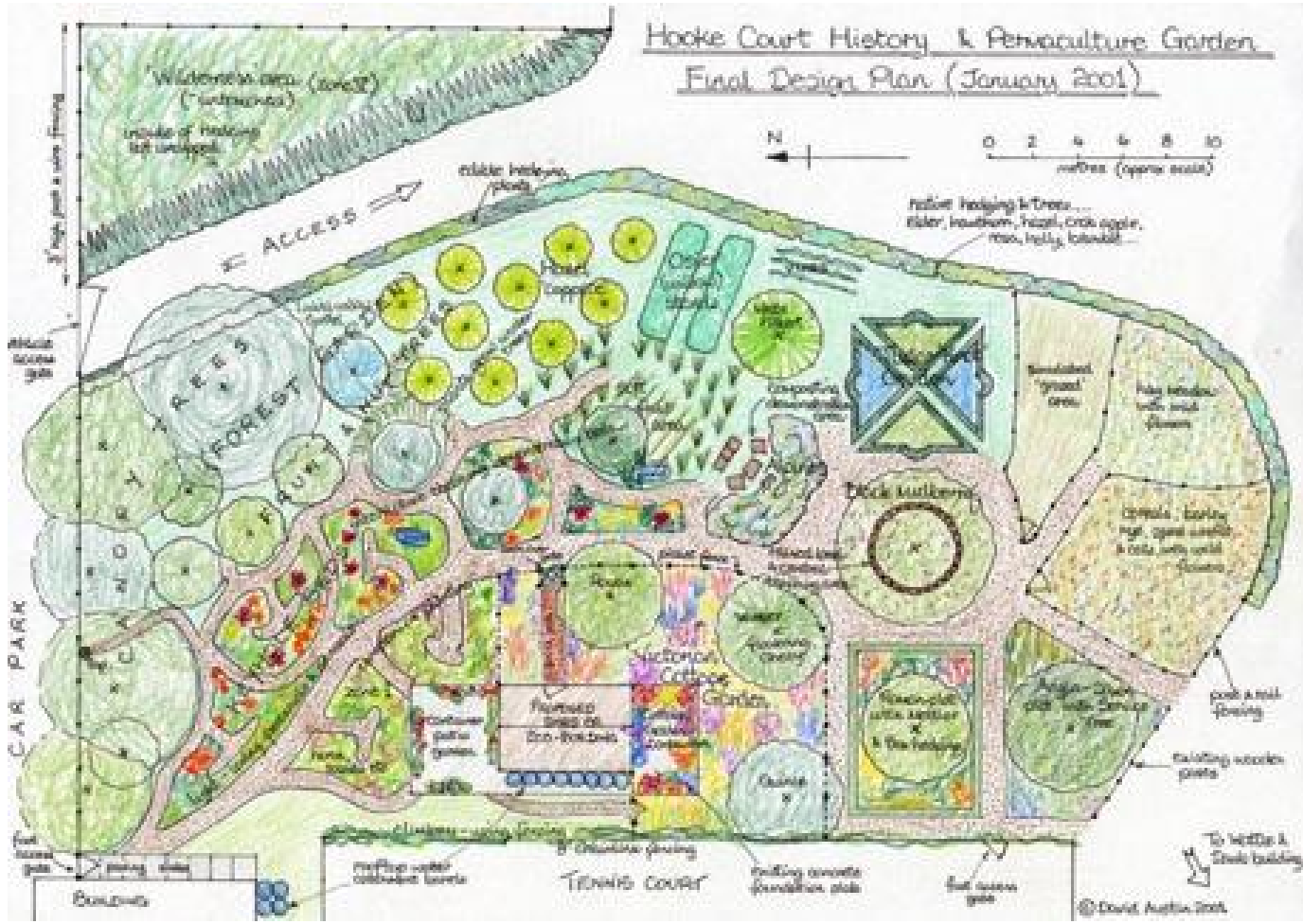
The problem is the solution!

Design Principles



- Make connections.
- Catch and store energy and materials.
- Stack functions.
- Make the least change for the greatest effect.
- Use small-scale, intensive systems.

Design Examples



Design Aims:

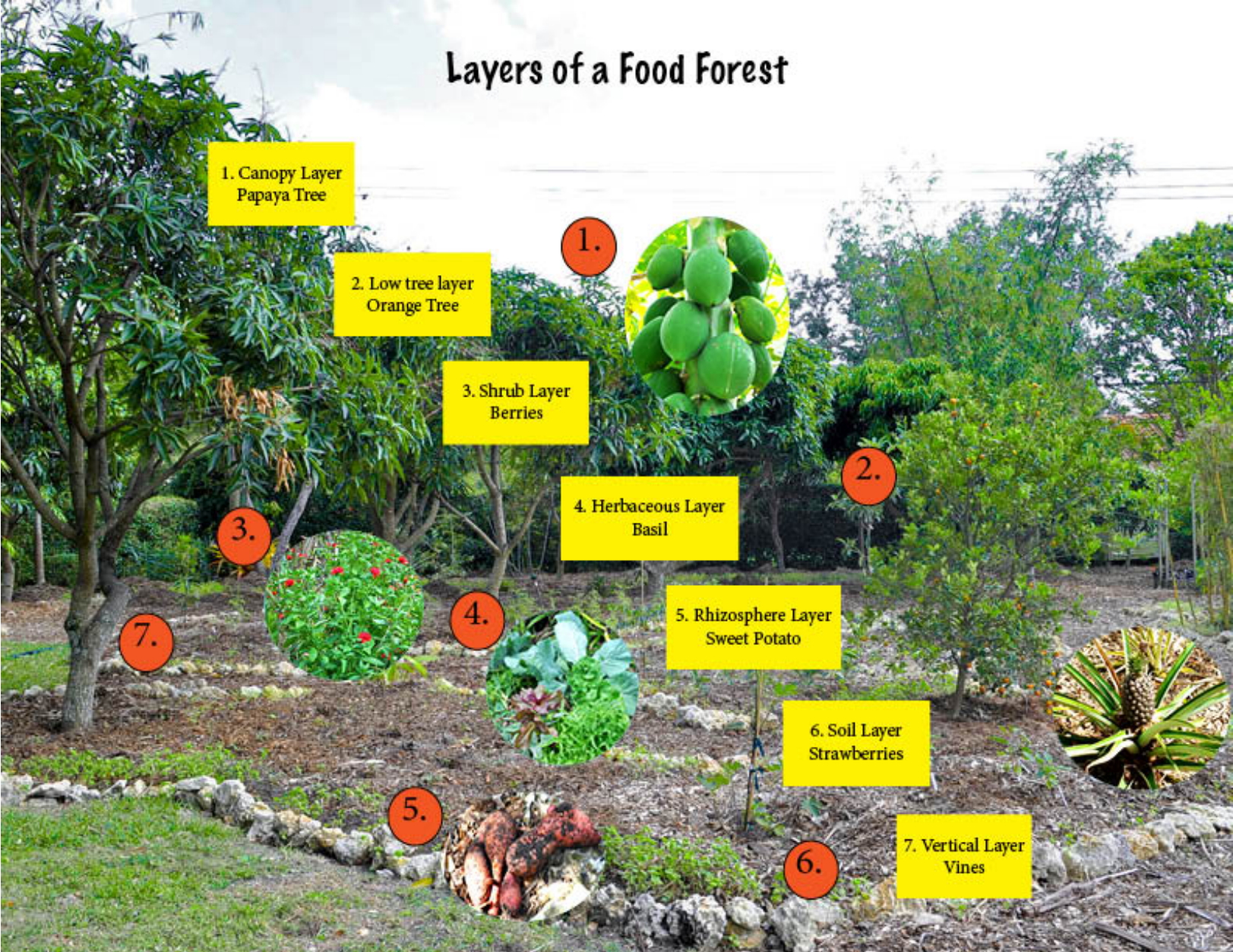
- Grow as much food as possible
- Provide food and habitat for beneficial critter friends
- Waste is put back into the system
- Build soil and store water
- Go with the flow (the problem is the solution!)
- Soil, sun, water, plants, wildlife...

Food Forests

- Vertical stacking of trees and plants
- Creates microclimates
- High biodiversity



Layers of a Food Forest





Hedgerows / Living Fences

- Defines boundaries / edges
- Water stored in biomass
- Edible possibilities (Fedge!)
- Noise reduction
- Windbreak
- Soil Stabilization
- Wildlife Corridor
- Attract beneficial insects











Guilds

Group of plants chosen to help each other:

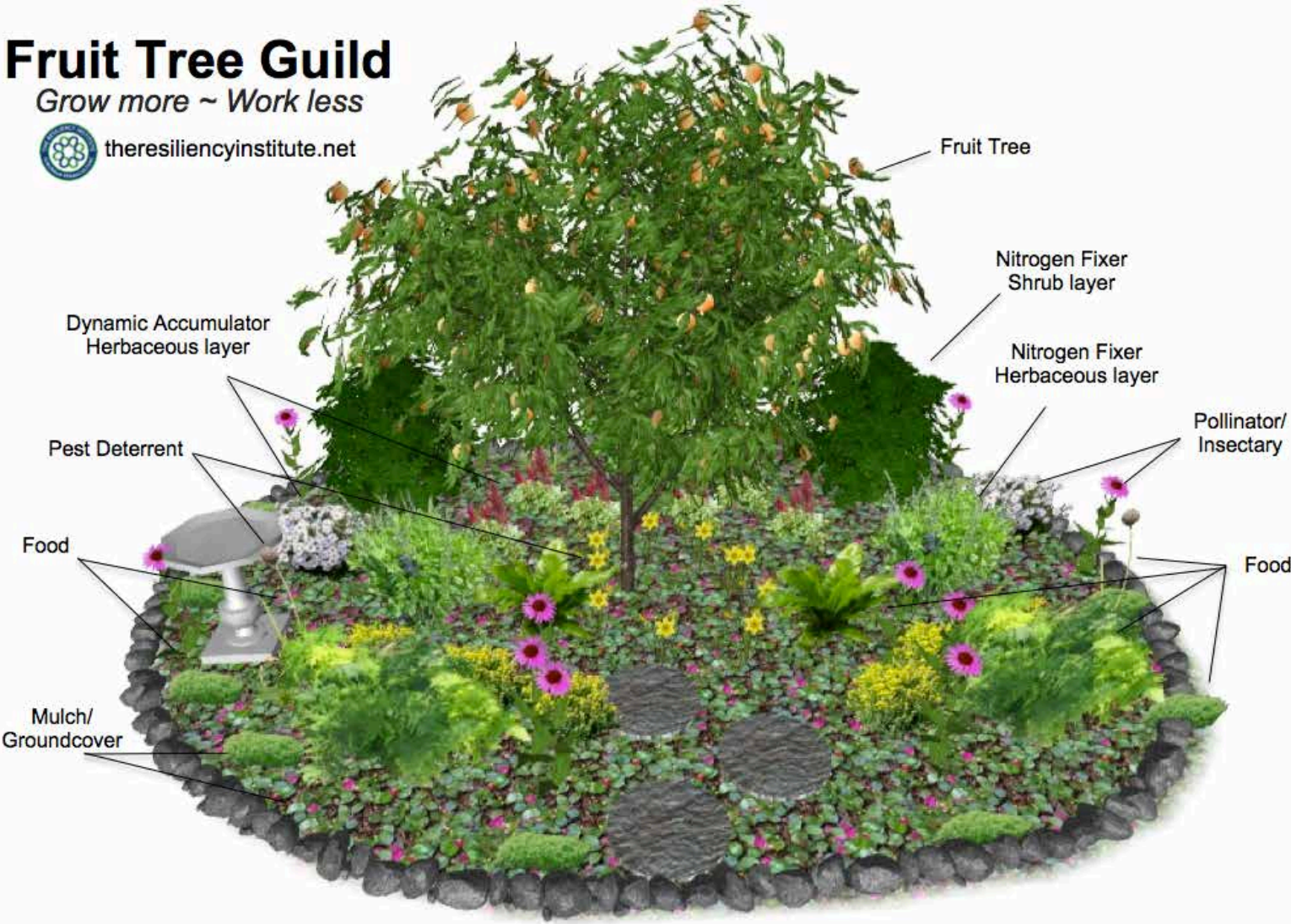
- attract beneficial insects
- deter wildlife
- fertilize
- mulch
- produce nectar to attract pollinators
- repel pests
- suppress grass

Fruit Tree Guild

Grow more ~ Work less



theresiliencyinstitute.net



Dynamic Accumulators

Fact or Fiction?

What we *do* know:

- Phytoaccumulation does happen

What we *don't* know:

- If the plant will make those minerals available to the soil and if they do, how long will it take?

DYNAMIC ACCUMULATORS

Dynamic Accumulator and the Periodic Table

N ALFALFA CLOVER SOYBEANS FIELD BEANS VETCH COMFREY KELP LICORISE ROOT LEAVES STINGING NETTLE	K BRAKEN FERN BORAGE CARROT LEAVES CHAMOMILE CHICKWEED CHICKORY CLOVER DOCK EYE BRIGHT FENNEL LAMBS QUARTER STINGING NETTLE MULLEIN OAK BARK PARSLEY PEPPERMINT PIG WEED PLANTAINS SANICLE SILVERWEED SOW THISTLE TOADFLAX WATERCRESS YARROW WAY WORT ORANGE & BANANA SKINS	P BARLEY BRAKEN EASTERN BRIDAL BOWER BUCKWHEAT CALAMUS CARAWAY CHAMOMILE (GERMAN) CHICKWEED CLOVERS DANDELION DOCKS GARLIC LAMBS QUARTERS LEMON BALM LICORISE ROOT LEAF LUPINE MARIGOLD FLOWERS MEADOW SWEET MUSTARDS PIGWEED, RED ROOT PURSLANE SAVOY SORREL VETCHES WATERCRESS YARROW
Mg BLADDERWRACK BROOM DROPS CARROT LEAVES COLTS FOOT COMFREY DANDELION DEVILS BIT DULSE HORSETAILS KELP MEADOW SWEET MISTLETOE MULLEIN PARSLEY	S COLTS FOOT EYEBRIGHT FENNEL GARLIC MEADOW SWEET MULLEIN MUSTARD STINGING NETTLE PLANTAINS REST HARROW SHEPHERDS PURSE WATERCRESS WAY WORT CABBAGE LEAVES ONIONS	I SANSAPARILLA BLADDERWRACK DEVILS BIT DULSE ICELAND MOSS KELP
Mn EASTERN BRAKEN CHICKWEED LAMBS QUARTERS	Co EASTERN BRAKEN HORSETAILS VETCHES	Fl WATERCRESS GARLIC
Cu EASTERN BRAKEN COLTS FOOT DANDELION STINGING NETTLES PLANTAINS SILVERWEED SOW THISTLE VALERIAN YARROW	Si OAT STRAW PLANTAINS VALERIAN BORAGE COMFREY DANDELION HORSETAILS	
B SPURGES CARDBOARD BOXES BEETROOT LEAVES		

Cherry



Comfrey



Garlic
Chives



TenthAcreFarm.com

Three Sisters



North American Traditional

- *Corn*
- *Beans*
- *Squash*



Hugelkultur



Fact or fiction?

find and they have never been officially translated to English.

The Science Behind Hügelkultur

There are no peer-reviewed, scientific studies on Hügelkultur. A few university students have conducted projects (Adams 2013; Laffoon 2016), but these have not been published in scientific journals. Thus, gardeners rely on popular books and websites for Hügelkultur information. In this section, we will review the evidence for Hügelkultur methods.

Scientific principles

Both Andrä and Beba promoted Hügelkultur as a “method based on biological principles.” It’s unclear, however, what these biological principles are. None are described in the brochure and there are no references. In fact, this method is at odds with the ecological principles behind soil building through litterfall. The guiding principles appear to be derived from the authors’ personal observations and Rudolf Steiner’s biodynamics lectures (which can be found online). The science behind the biodynamics approach has been previously reviewed (Chalker-Scott 2013).

Excessive use of rich organic material

The authors seem unaware that nutrient-rich organic matter can be overused. Directions for building Hügelkultur mounds include the addition of a foot of dead leaves, a few inches of composted manure, and three to four inches of compost (Beba and Andrä n.d.). Decomposing organic material can release excessive nutrients, contaminating soil and water habitats



Figure 2. The original German booklet published by Andrä and Beba. This copy was obtained through an international bookseller.

This is why commercial compost piles are managed on concrete pads with contained drainage (Harrison et al. 2004-2005).

Practicality of mound structures

The mounding process can create other problems. Weeds are acknowledged as a significant problem and colonize mounds rapidly unless mulch is used. The mounds will collapse over

Hügelkultur: the mound method for home gardeners

January 13, 2018

- Writer: Adam Russell, 903-834-6191, adam.russell@ag.tamu.edu
- Contact: Dr. Joe Masabni, 903-834-6191, joe.masabni@ag.tamu.edu

OVERTON – A bedding system new to Texas – hügelkultur – is trending among home gardeners looking for low-maintenance ways to grow flowers, fruits and vegetables, said Texas A&M AgriLife Extension Service horticulturist Dr. Joe Masabni.

Hügelkultur, German for “hill culture,” is the practice of composting large woody material, such as tree logs, to create a raised garden bed, said Masabni, who is based in Overton. Other excess garden waste, including prunings, hedge clippings and brushwood can be utilized to create the no-till bed for plants.



Hügelkultur mounds should be planted with a cover crop such as ryegrass or clover prior to garden establishment to prevent erosion. (Photo by Bridgit Corbett, Denton County Master Gardener)

Masabni said hügelkultur is a good way to compost without the hard work of tilling and bed preparation every year. He collaborated with Bridget Corbett, a Master Gardener in Denton, on a hügelkultur project to provide valuable information about the method for growers.

“I joke when I call it the lazy man’s composting,” he said. “As time goes by and the log rots, the deep soil of the bed becomes rich with soil microorganisms, earthworms and microbes. It’s a great way to employ a low-maintenance, no-till strategy for your home garden.”

Masabni said the microorganisms that thrive in the rotting material release nutrients to plants. Rotting wood will also hold moisture longer in dry periods.

Bioswales

- Farm-scale
- Sunken
- Flat bottom – on contour
- **Designed to:**
capture and slow water



Urban Bioswales

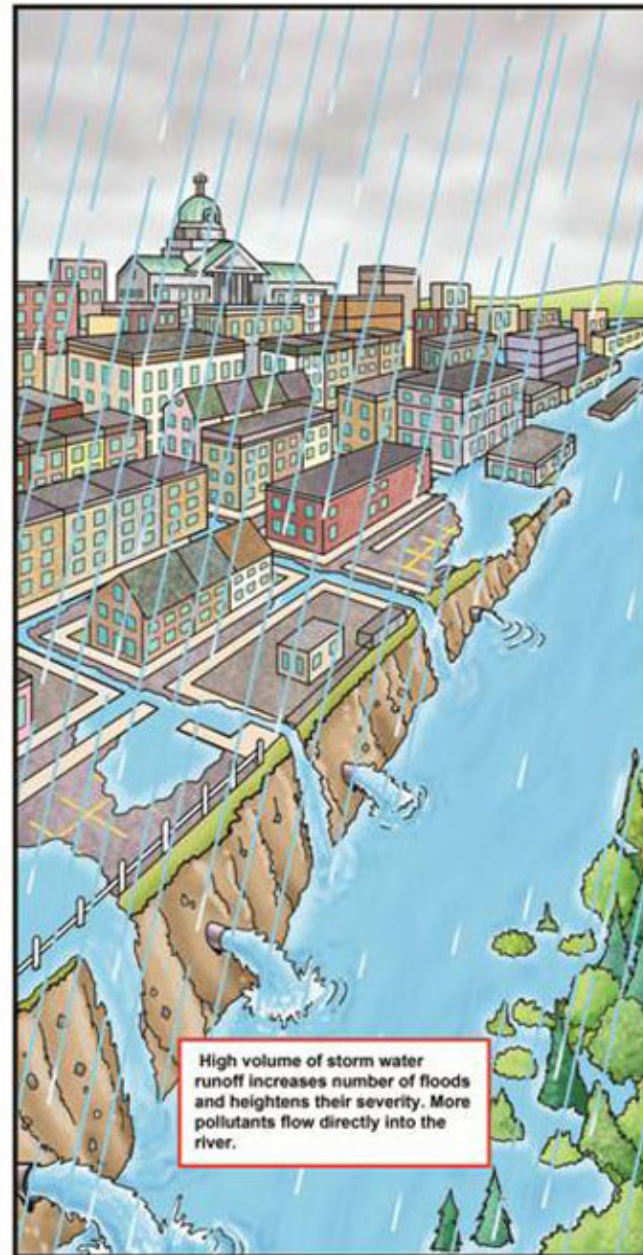
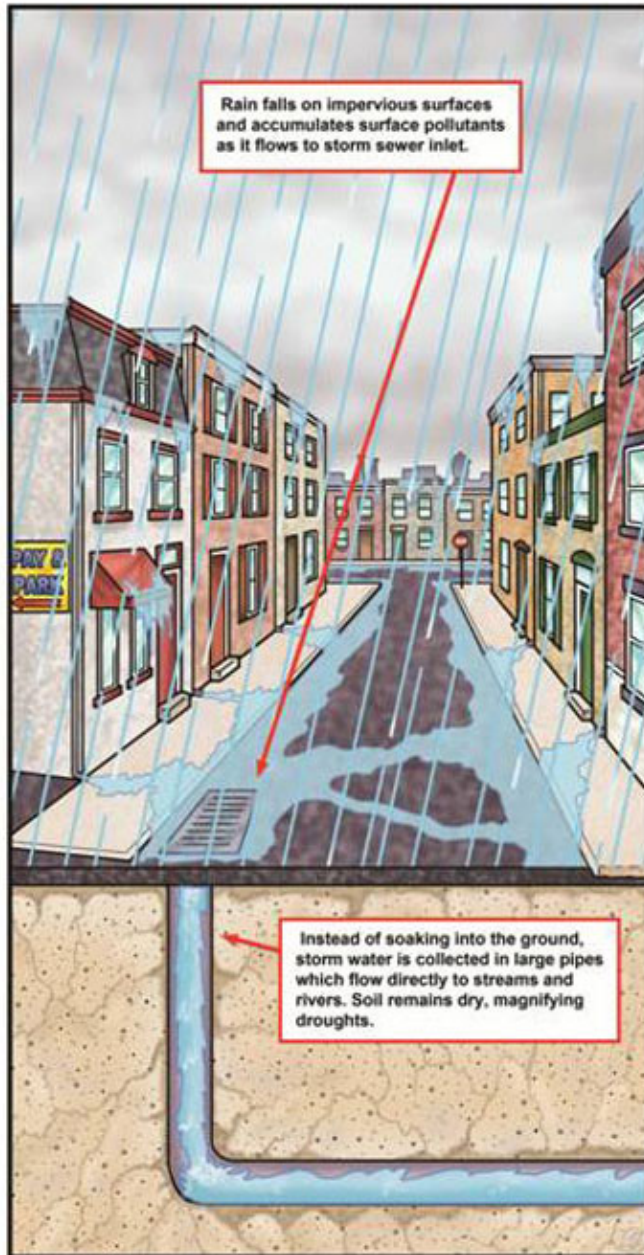
- Sunken
- Flat bottom – on contour
- **Designed to:**
 - capture and slow water
 - *filter urban pollutants*



Impervious Surfaces

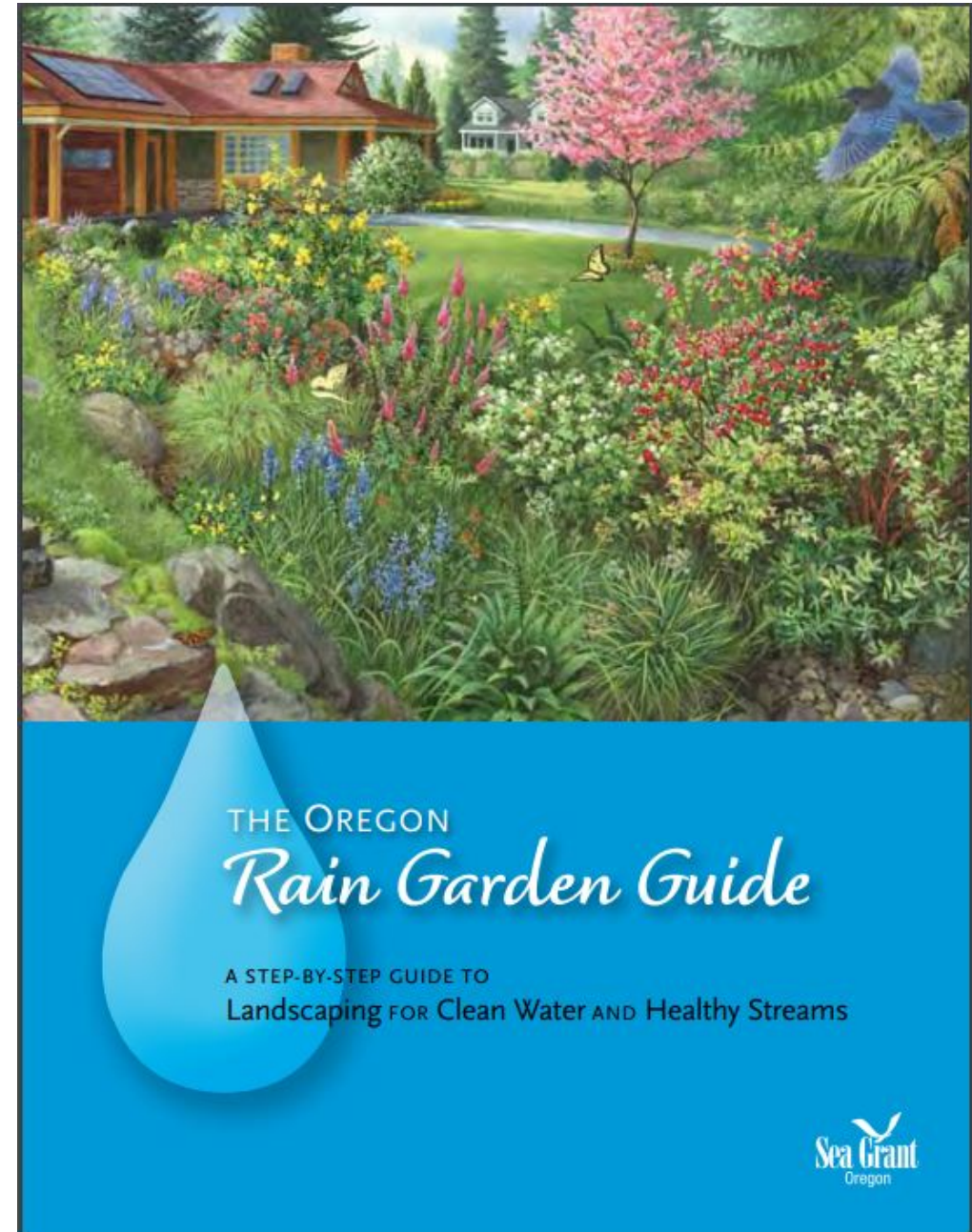
- Do not allow rainwater to infiltrate or soak into soil
- Concrete, roofs, driveways, sidewalks, roads, etc.
- Severe compaction from heavy equipment or foot traffic

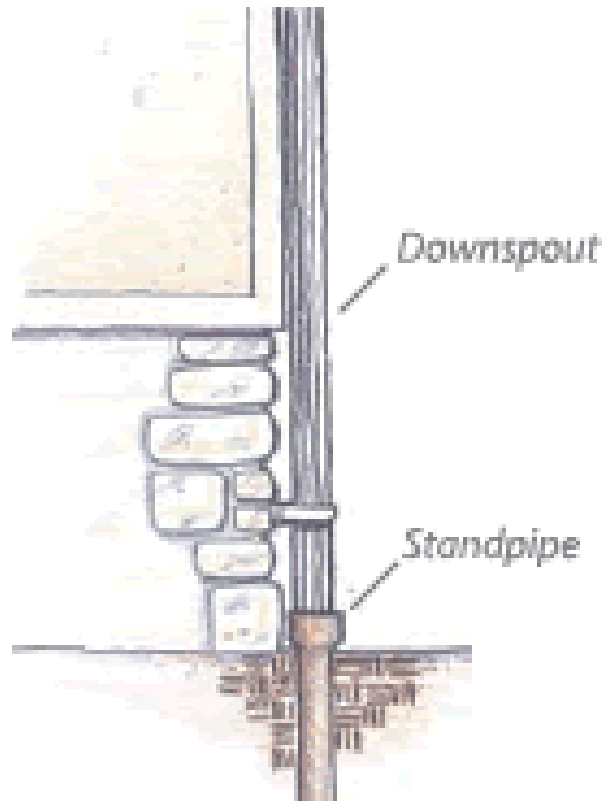




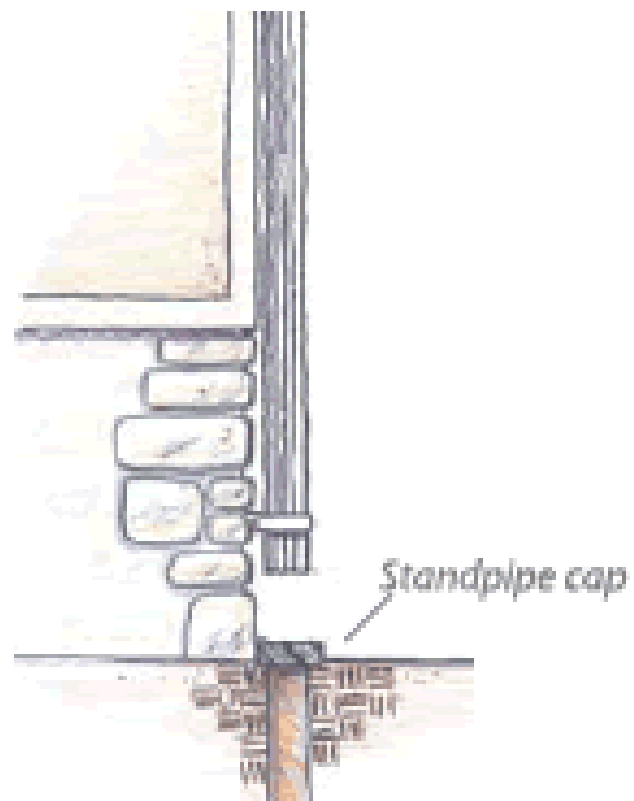
Rain Gardens

- Sunken, flat-bottomed garden bed
- Collects and treats stormwater runoff from rooftops, driveways, sidewalks, parking lots, and streets
- mimic natural forest, meadow, or prairie conditions
- Filters out urban pollutants

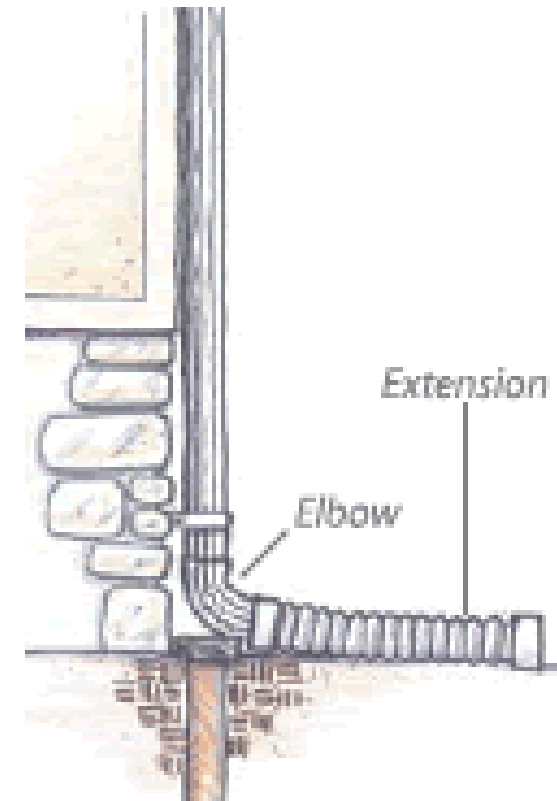




Downspout connected to standpipe.

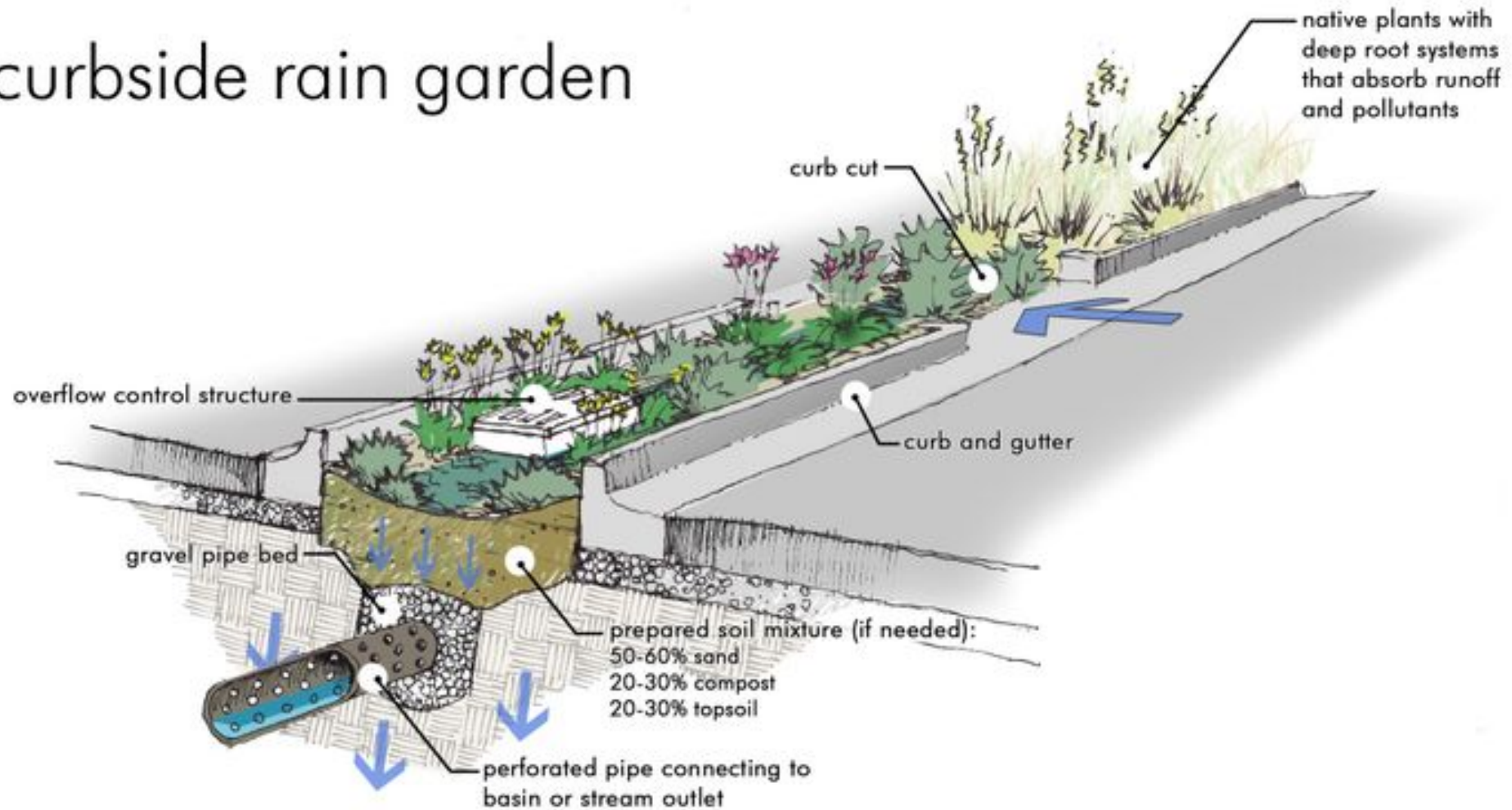


Elbow and extension attached to downspout.





curbside rain garden







African Keyhole Design











Herb Spiral

- Many microclimates
- Hot on south side, cool on north side
- Drier at the top, moist at the bottom
- Vertical design



Observation

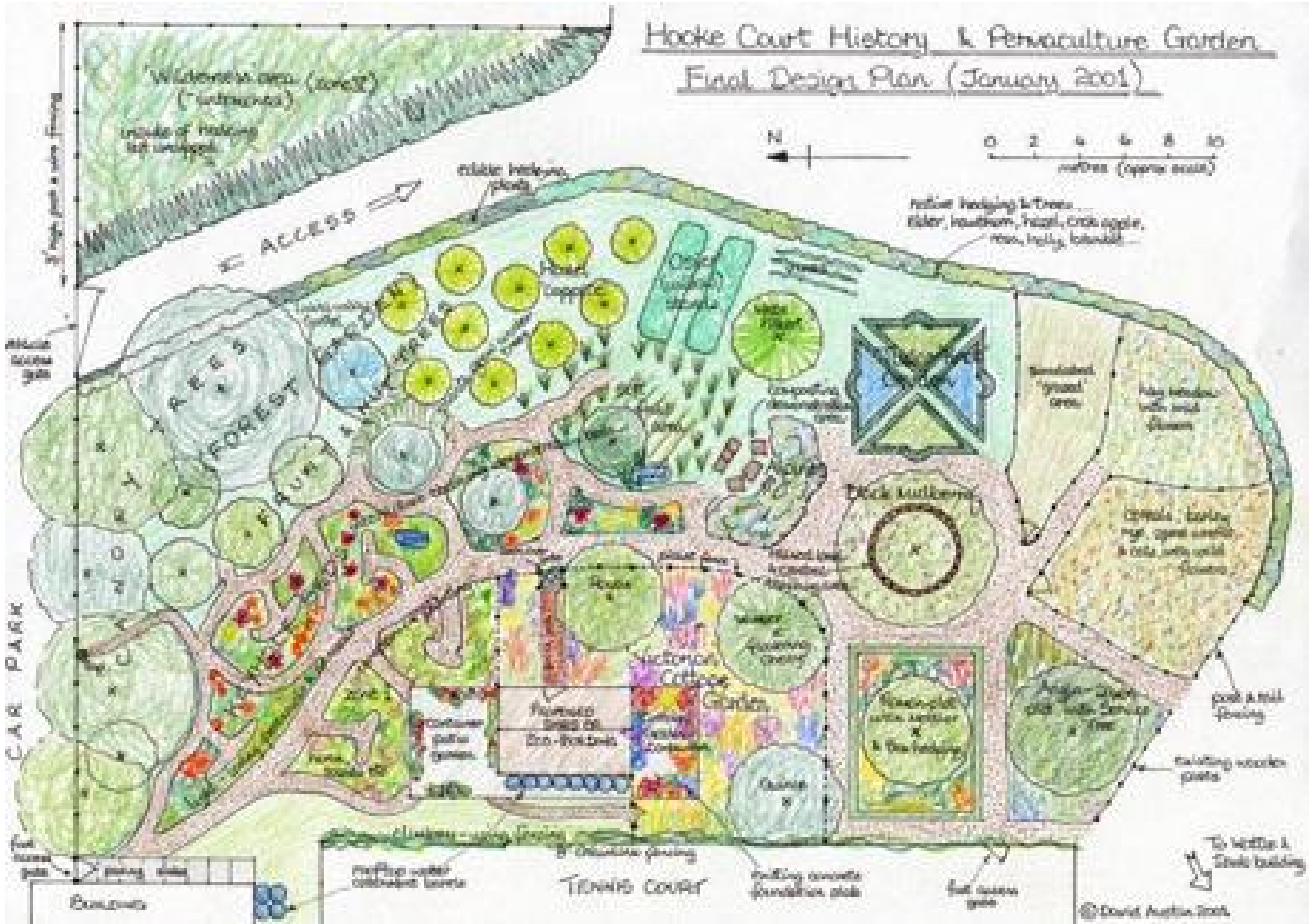
The HEART of Permaculture design!

Observation

- What kind of **soil** do I have? Is it all the same?
- Where in my yard gets the most **sun**? The least?
- Where does **water** flow in my yard? Where does it puddle?
- Which direction does the **wind** come from?
- Which **plant** species are growing naturally here?
- Which **wildlife** friends visit my yard?

...through the day and through the seasons

Site Analysis + Design Aims



Design Aims:

- Grow as much food as possible
- Provide food and habitat for beneficial critter friends
- Waste is put back into the system
- Go with the flow (the problem is the solution)
- Soil, sun, water, plants, wildlife...

