

Eureka Springs Native Plant Collaborative

Eureka Springs Community Center
Eureka Springs Parks and Recreation
Carroll County Master Gardeners
Northwest Arkansas Master Naturalists
Wild Ones – Ozark Chapter



1

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or



2

Permaculture and Organic Gardening Techniques

Mariellen Griffith and Jerry Hembd



3

What Is Permaculture?

It is a **philosophy of working with, rather than against, nature**. It is a **systems approach** that involves **thoughtful observation**, not thoughtless labor, looking at plants and animals in all their functions rather than treating many areas as a single product system.

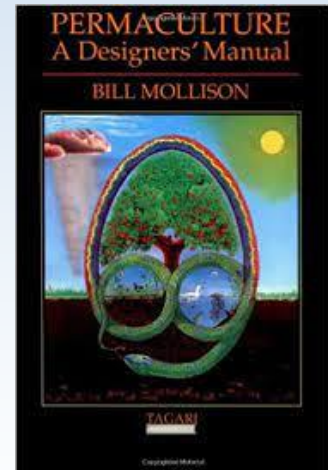
Synonymous with *permanent culture* in its broadest sense, permaculture is a **global ethic method for designing integrated systems** based on the idea of sustainable development. Therefore, **human activities must consider natural ecosystems** and operate in harmony with them.

Permaculture gardening is based on the concept of **designing your garden around your local environment**. ... Permaculture gardening also focuses heavily on gradually **building up soil quality** with nutrients so that you're constantly **rejuvenating the earth as you strengthen the health of your plants**.



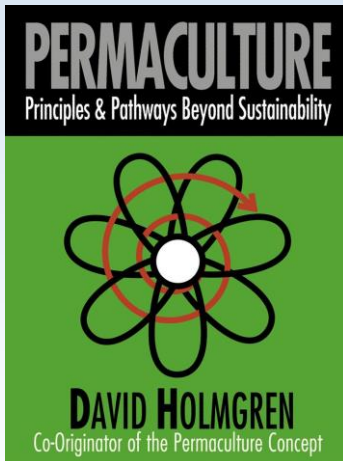
4

Bill Mollison – Co-originator



5

David Holmgren – Co-originator



6

Characteristic	Industrial culture	Sustainable culture
Energy base	Nonrenewable	Renewable
Material flows	Linear	Cyclical
Natural assets	Consumption	Storage
Organization	Centralized	Distributed network
Scale	Large	Small
Movement	Fast	Slow
Feedback	Positive	Negative
Focus	Center	Edge
Activity	Episodic change	Rhythmic stability
Thinking	Reductionist	Holistic (systems)

Source: Holmgren, David. *Permaculture: Principles & Pathways Beyond Sustainability*. Hepburn, Victoria, Australia: Holmgren Design Services, 2002.



7

Transition Towns



8

Distinguishing Characteristics

- Peak oil and climate change as drivers
- Power of a positive vision
- Psychology of change (and addiction)
- **Permaculture concept as a principal foundation**
- Energy descent plans
- Building resilience
- Participatory, process-oriented, non-prescriptive
- Community-level origin and focus



9



10

Permaculture Design Certification (PDC) Course

- Observations and Patterns
- Principles and Ethics of Permaculture
- Zones and Sector Analysis
- Soils, Plants, and Trees
- Guilds and Polycultures
- Water and Earthworks
- Utilizing Micro-climates
- Designing with Succession in Mind
- Designing for Different Climatic Zones
- Aquaculture
- Eco-Building
- Alternatives to Alternative Energy
- Designing a Homestead
- Garden Management
- Small-Farm Strategies
- Large-Farm Possibilities
- Creating Real Abundance
- Urban and Suburban Permaculture
- International Implications
- Starting a Permaculture Business
- Working with People
- Building Authentic and Lasting Community
- More...



11



12



13



14



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16



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18

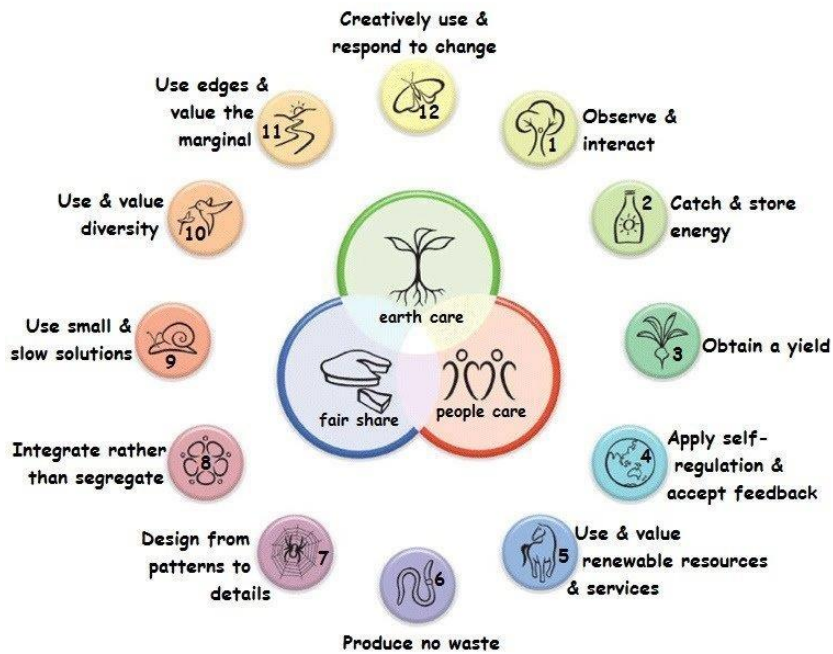
Permaculture Ethics



19



20



21



1: OBSERVE AND INTERACT

'Beauty is in the eye of the beholder'



- Good design depends on a free and **harmonious relationship between nature and people**
- Pay attention
- Non-judgmental observation
- Developing a **relationship with the land**
- Watch what nature does and learn from it
- **Avoid placing stress** on natural or human systems
- Locally evolved models
- Generate independent, even heretical, **long-term thinking**



22



23



2: CATCH AND STORE ENERGY

'Make hay while the sun shines'



- Catch and store as much energy as possible and slow the rate at which it leaves system
- Rebuild **natural capital**: water, nutrients/minerals, carbon, soil, organic matter, etc.
- Ensure development and best use of **human capital**
- Appropriate use of nonrenewable resources (**built capital**)
- Harvest while it is abundant
- Understand energy laws



24

Solar Energy

- 24-panel array
- Net metering
- Operates within a net zero range on annual basis
- High-efficiency heat pump
- Porches, shades, attic fan



25

Natural Capital

Water

- Movement across land (bed location)
- Berms (swales)
- Capture (1 inch rain is 0.623 gallons per square foot)
- $3,000 \times 0.623 = 1,869$ gallons

Organic Matter

- Kitchen compost
- Grass clippings
- Mulch
- Leaves, branches, etc.
- Sheet mulching



26



3: OBTAIN A YIELD

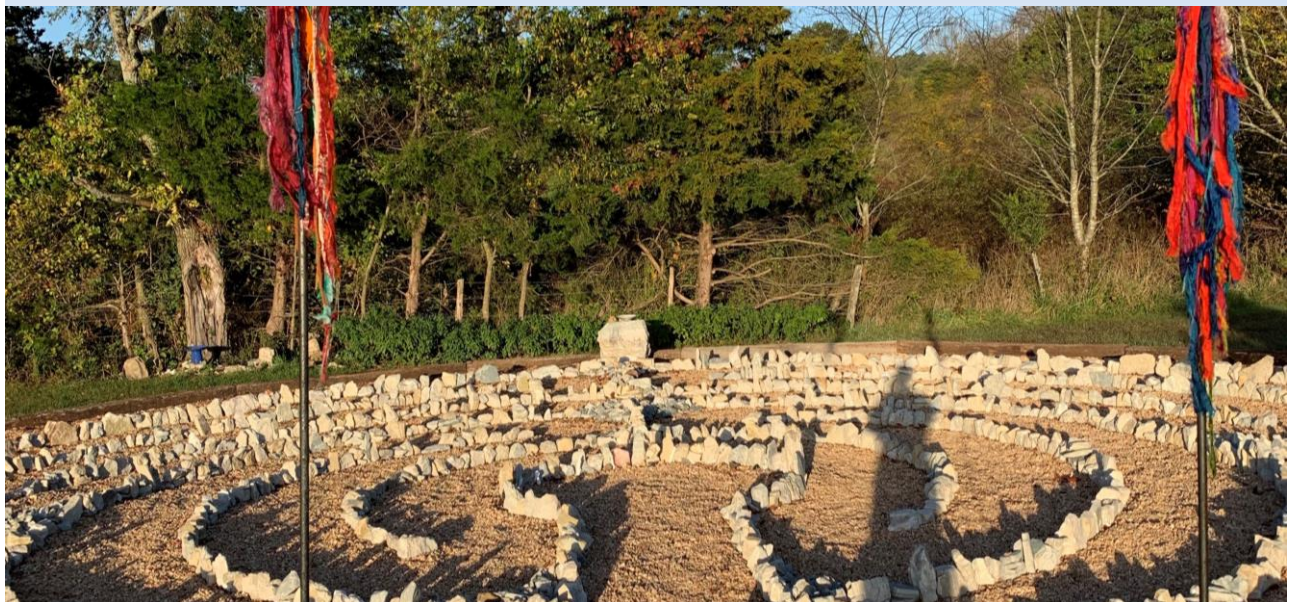
'You can't work on an empty stomach'



- Yield is defined as the **surplus** over and above the needs of the system
- Make sure you're getting valuable results
- Design system to provide for **self-reliance** at all levels, including ourselves
- Honest acknowledgement of sources of affluence and **real measures of success**
- Design all systems to be productive in some way
- **Take care of yourself**, make a profit, and grow a good harvest



27



28



4: SELF-REGULATE: ACCEPT FEEDBACK

'The sins of the fathers are visited unto the seventh generation'



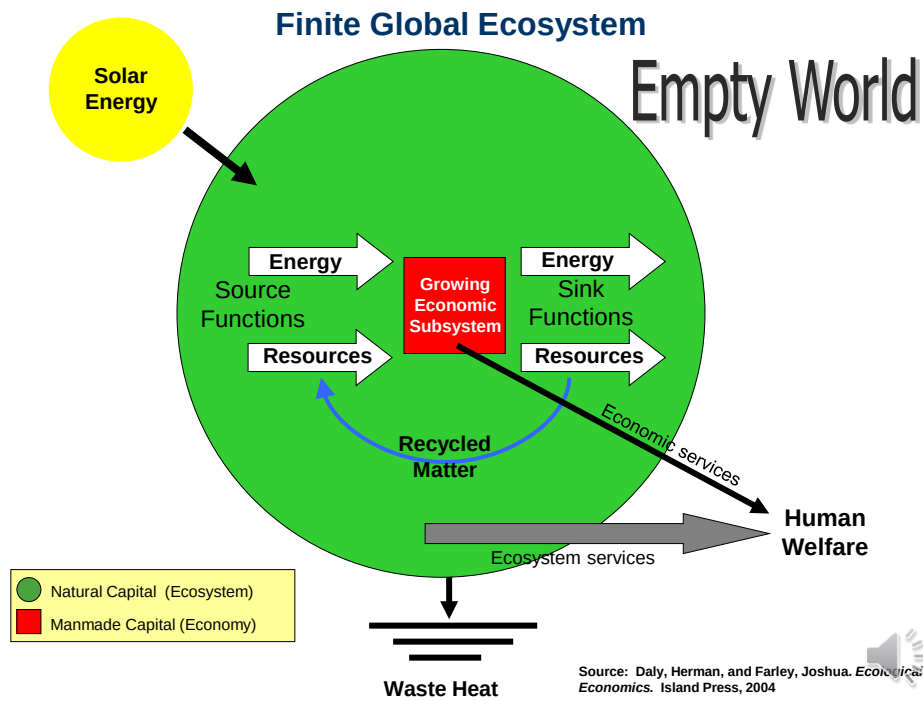
- **Self-maintaining and regulating systems** might be said to be the 'Holy Grail' of permaculture: an ideal that we strive for but might never fully achieve
- **Gaia Hypothesis** a suitable image for this principle
- Be open to **modify dysfunctional behaviors**
- Regain our **intuitive understanding** of our world's unique language and **hear what it is saying to us**
- The key is to understand that **everything we do has an impact upon our world**



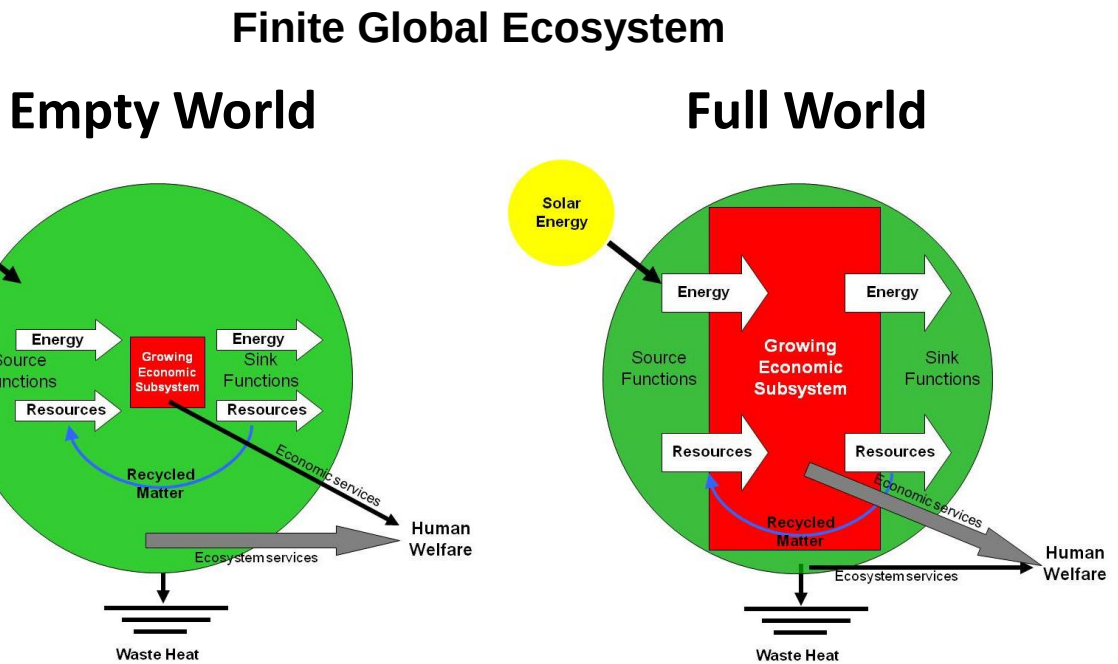
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30



31



32



5: USE AND VALUE RENEWABLES

'Let nature take its course'

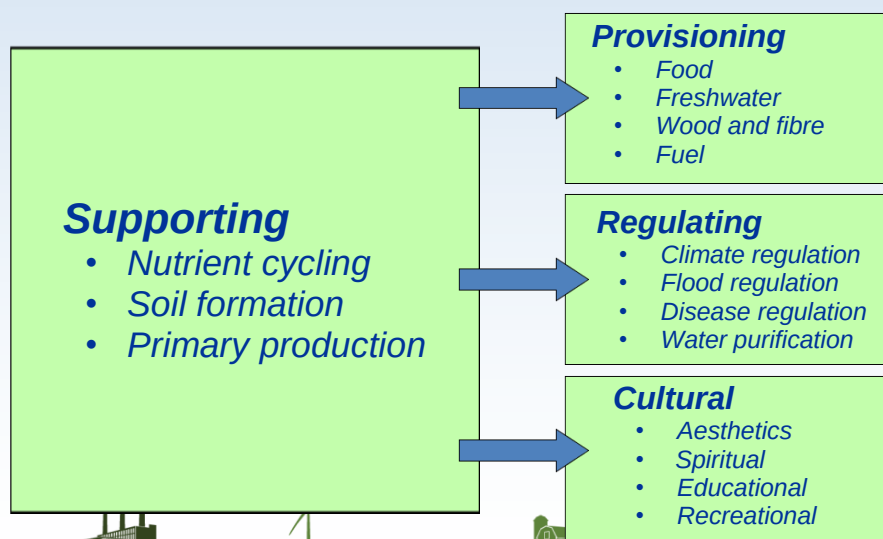


- **Renewable resources** are our sources of **income**, while **non-renewable resources** can be seen as **capital assets**
- Renewable services (or passive functions) are those we gain from plants, animals and living soil and water, without them being consumed
- **Natural ecosystems**, unlike non-renewable resources, become **more complex and efficient over time**
- The key to wise resource use is to abide by **the principle of "enough"**
- Reduce dependency on scarce resources



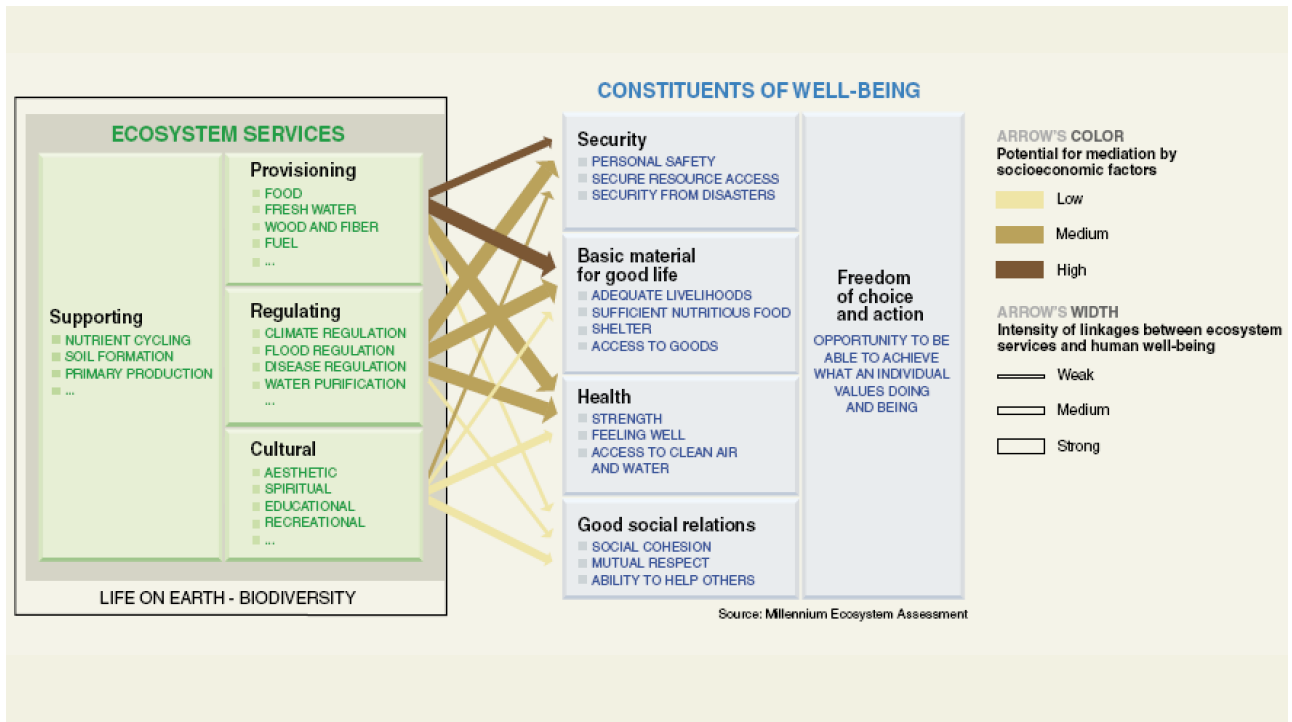
33

Categories of Ecosystem Services



Source: Millennium Ecosystem Assessment. 2005. Washington, DC: Island Press.

34



35



6: PRODUCE NO WASTE

'Waste not, want not' . . . 'A stitch in time saves nine'

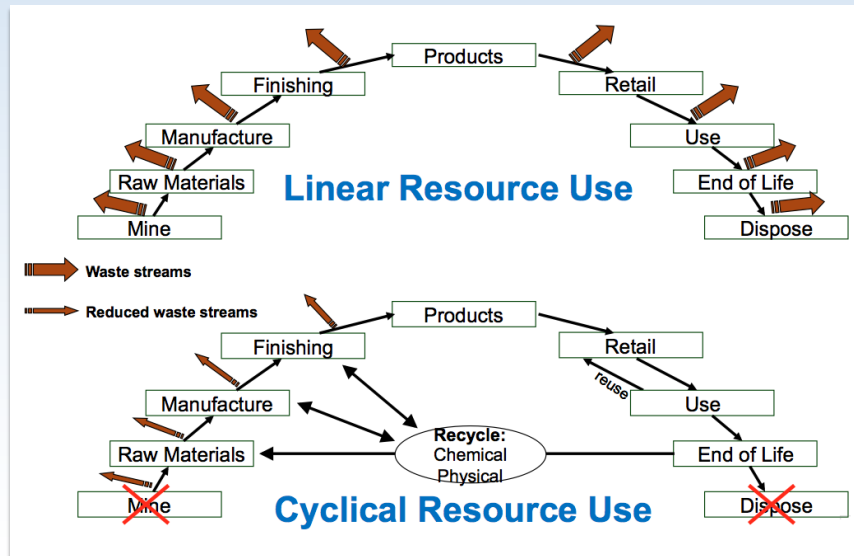


- This principle brings together traditional values of frugality and care for material goods, the modern concern about pollution, and the more radical perspective that sees **wastes as resources and opportunities**
- Mollison defined a pollutant as "an output of any system component that is not being used productively by any other component of the system"
- **In nature there is no such thing as waste**
- **There is no such thing as "away"**
- Circular economy, closed loop, industrial ecology, etc.



36

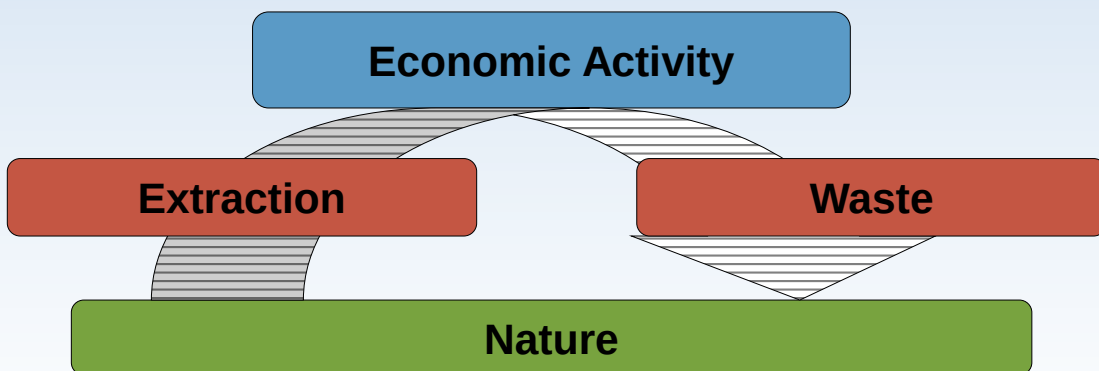
Resource Use: Linear to Cyclical



Source: The Natural Step

37

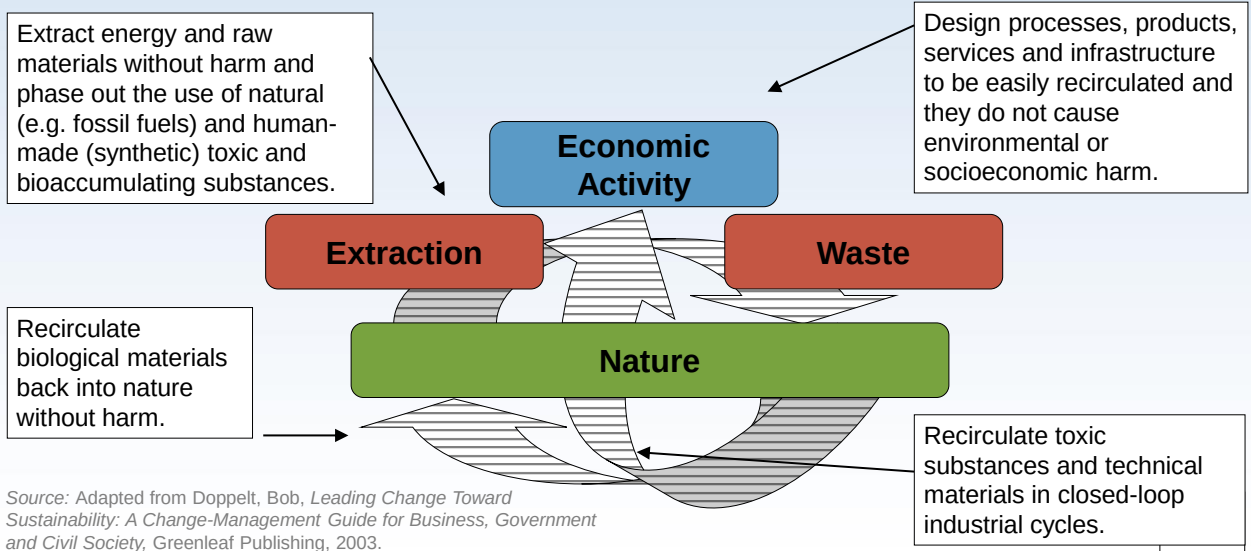
Take-Make-Waste Economic System



Source: Adapted from Doppelt, Bob, *Leading Change Toward Sustainability: A Change-Management Guide for Business, Government and Civil Society*, Greenleaf Publishing, 2003.

38

Sustainable Borrow-Use-Return Economic System



39



Hugelkultur



40



7: DESIGN FROM PATTERNS TO DETAILS

'Can't see the wood for the trees'



- The idea that initiated permaculture was the forest as a model for agriculture, an example of **pattern thinking**
- Observe natural/social patterns and **apply them to design**
- Patterns are everywhere in nature:** symmetry, spirals, branches, cracking patterns and nets, waves, lobes, foams, streamlines, fractals, scatters, etc.
- Details tend to distract our **awareness of the nature of the system and the larger picture**
- Icon evokes zone and sector site planning

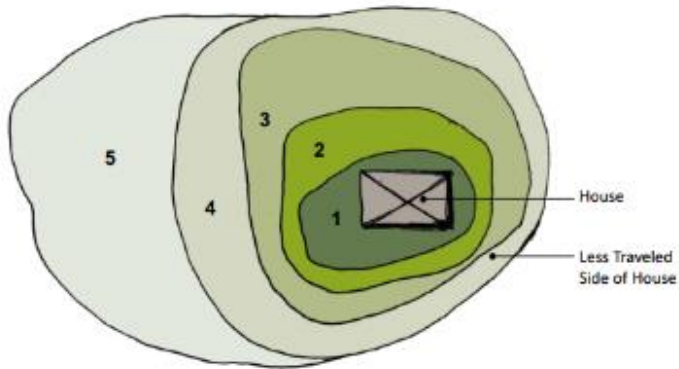


41

Herb Spirals



42



ZONES

1. Closest to the house and along frequently traveled paths
 - Seedlings in need of frequent watering
 - Salad Vegetables
 - Favorite Flowers
 - Commonly Used Herbs
 - Compost Collection
2. Also frequently visited but less often than zone 1
 - Small Fruit Trees
 - Shrubs
 - Trellised Fruit
 - Bramble Berries
 - Ponds
 - Windbreaks
 - Vegetables that only fruit once
 - Unruly Rambling Vines
3. Large, low maintenance trees and crops
 - Large Fruit/ Nut Trees
 - Main Crop Areas
 - Large Pastures
4. Utilized for gathering wild foods and growing timber
5. Unmanaged brush (like a wildlife preserve)



43

Zone 1

- Vegetables
- Herbs
- Rhubarb
- Asparagus
- Corn
- Pollinator gardens



44

Zone 2

- Fruit trees (apple, pear, peach, cherry, mulberry, pawpaw, fig)
- Berries (blueberries, blackberries, raspberries)
- Pollinator garden
- Rain garden



45

ATTRA Sustainable Agriculture

A program of the National Center for Appropriate Technology • 1-800-346-9140 • www.attra.ncat.org

Fruit Trees, Bushes, and Vines for Natural Growing in the Ozarks

By Gary K. Arnes
NCAT Horticulture Specialist
Published Feb. 2016
ENR-11

Contents	
Return of the Natives.....	1
What to Do About Common Problems for Fruit Plants.....	2
Traps for Natural Growers in the Ozarks.....	3
Conclusions.....	11
About the Author.....	14
Further Resources.....	15



Amber muscadine. Photo: Gary K. Arnes, NCAT

Return of the Natives?

Because of culture and tradition, we think of the apple before the pawpaw, the peach before the persimmon, the seedless grape before the muscadine. As good as substitutes as apples, peaches, and seedless grapes are, they are subject to a myriad of pests and diseases in the Ozarks, and most varieties of these fruits can hardly be grown at all without regular applications of pesticides. On the other hand, native grapes, persimmons, and muscadines require no pesticides at all to yield their bounty. And there are other non-native species and lesser-known varieties of well-known species that can be grown in the Ozarks naturally

without pesticides. This holds broadly true for all of the upper South, especially the southern highlands from the Arkansas and Missouri Ozarks east, through the southern Appalachians, to the Virginia Piedmont.

The heat and humidity of Ozark growing seasons are especially conducive to pests and diseases of fruit trees, vines, and bushes. Unfortunately, apples, peaches, and grapes – especially varieties like Gala apple, Redhaven peach, and Flame Seedless grapes – commonly sold in local retail markets and big box stores are susceptible to these local pests and diseases.

Such plants cannot be grown without the help of

ATTRA promotes increasing a program of the National Center for Appropriate Technology (NCAT). The program is funded through a cooperative agreement with the United States Department of Agriculture's Rural Business Cooperative Center that the NCAT website provides information on other sustainable agriculture and energy projects.

www.attra.ncat.org

Page: 1



46



8: INTEGRATE (DON'T SEGREGATE)



'Capitalize on how things work together'

Integrate rather than Segregate

Polyculture vs. Monoculture



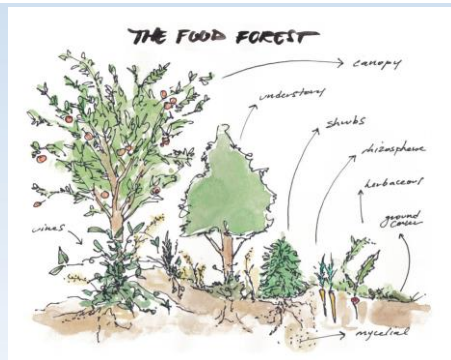
- **Connections and relationships** between things as important as the things themselves – **systems thinking**
- Each system element performs many functions; each important function is supported by many elements
- Seek to **find multiple functions for each element in a system**, and locate them in the best position for them to perform all those functions, as well as assist in the functions of other elements in the system → **resilience thinking**
- Permaculture favors an **interplanting** system



47

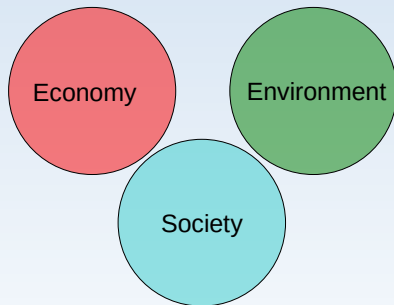


Plant Guilds
Food Forests
Forest Garden

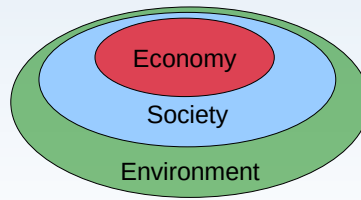


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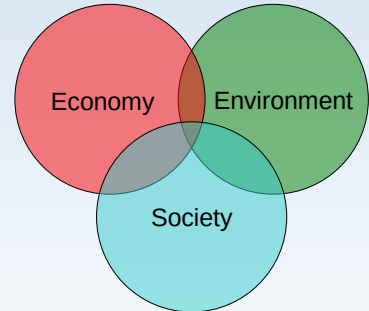
Evolving Views – The Zen of Venn



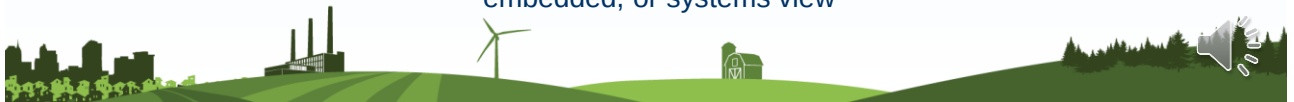
Unconnected
or silos view



Interdependent, nested,
embedded, or systems view



Interconnected or
linkages view



49

Reductionist Thinking

Traditionally, we try to understand complex systems by studying the **individual parts**.

This is called **reductionist** thinking.



50

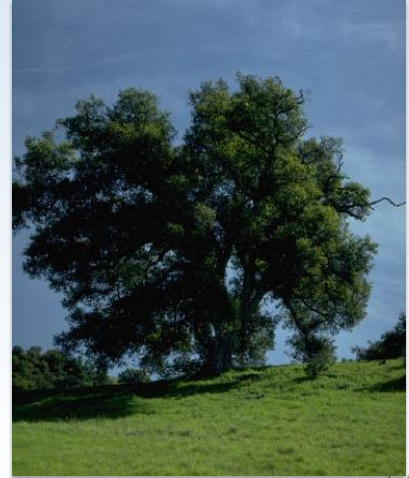
Systems Thinking

Systems consist of **interrelated parts**.

Systems depend on the **relationships between the parts**.

Dissecting the system **destroys the pattern of relationships**.

Relationships make the **whole greater than the sum of the parts**.



51



9: USE SMALL, SLOW SOLUTIONS



'The bigger they are, the harder they fall'

'Slow and steady wins the race'

- Systems should be designed to perform functions at the **smallest scale** that is practical and energy-efficient for that function; in social organizations this principle is called subsidiarity
- A focus on human scale and capacity
- Local resources and responses
- Start small so **"learning curve"** has less of an impact
- Mobility and speed in affluent countries have become so dysfunctional that the **Slow Food, Slow Cities, and Slow Money** movements are gaining much support



52

Raised beds

Adding one or two per year as part of the learning process

Experimenting with types of season extension



53



54



55



10: USE AND VALUE DIVERSITY



'Don't put all your eggs in one basket'



- Diversity of different cultivated systems reflects the **unique nature of site, situation and cultural context**
- The great diversity of forms, functions and interactions in nature and humanity are the source of evolved **systemic complexity**
- The more diverse an area and its indigenous species, the more likely it is able to continue to sustain life even under the most extreme conditions
- Best balance for an ecosystem is a mix of **young and old elements**
- Diversity leads to resilience



56

The Problem Is the Solution

OR

A problem can be a solution to some other problem

OR

A problem can suggest a solution that bypasses the problem

Armadillos?



57



58



59



60



61



62



63



64



65



11: USE EDGES, VALUE THE MARGINAL



'Don't think you are on the right track just because it is a well-beaten path'

- Creation of complex boundary, or edge, conditions is a basic design strategy for **creating spatial and temporal niches**
- Edges between ecosystems are the most **diverse** places within them
- Edges and margins between things are where the **dynamics shift**
- Important things happen at the intersections
- Design to allow the **differences** to produce **mutually beneficial outcomes**
- The living **soil is an edge/interface** between non-living mineral earth and the atmosphere



66

12: CREATIVELY USE/ RESPOND TO CHANGE

'Vision is not seeing things as they are but as they will be'



- **Change is constant**
- **Designing** to make use of change in a deliberate and cooperative way
- Creatively **respond or adapt** to large-scale system change that is beyond our control or influence
- **Envision possibilities and intervene** in effective ways
- Accelerate ecological succession
- Recognize **scale-dependent** nature of change
- Change only what must be changed, and only when and how it must be changed



67



68

What I Like About Permaculture

- Science-based
- Both bottom up and top down
- Holistic
- Experiential
- Iterative
- Design emphasis
- Practice emphasis
- It's all about relationships
- Time and change



69

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Next: Mariellen



70