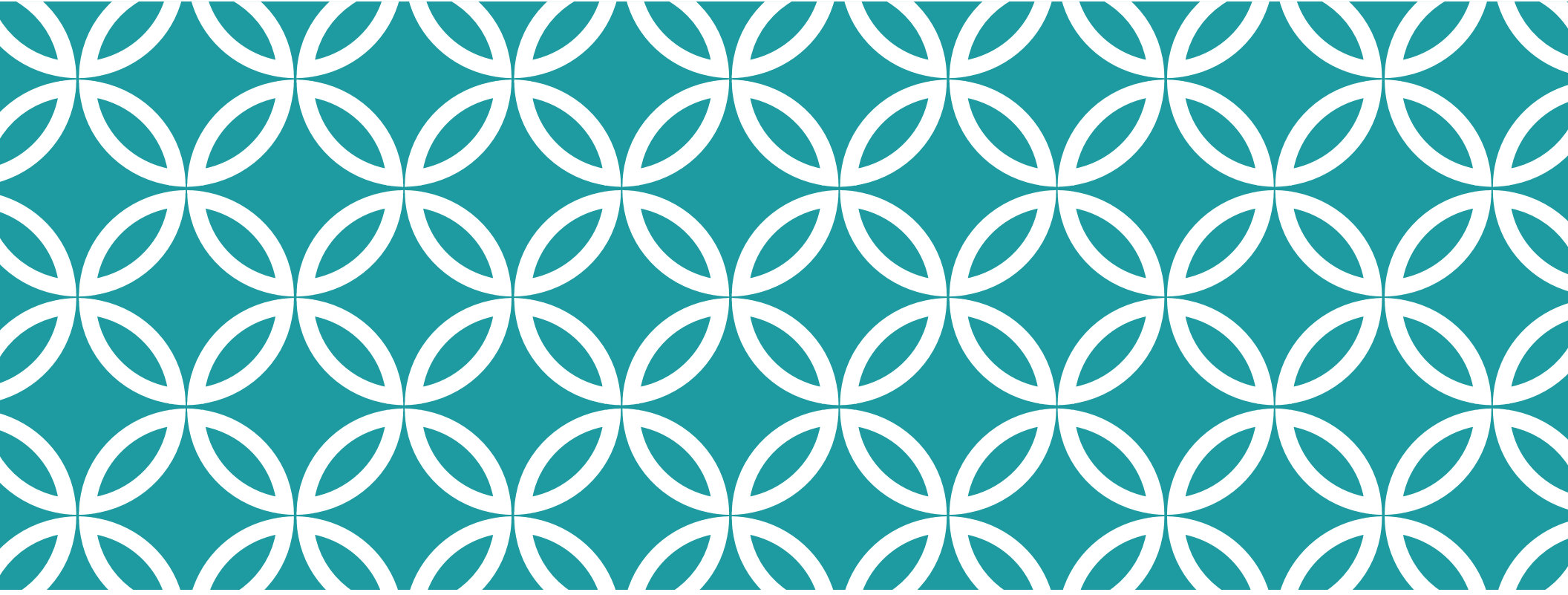


QUICK & DIRTY PERMACULTURE GUILD-BUILDING

Jonathan Storvick
Natural Resource Manager
Office of Sustainability
George Mason University



PERMACULTURE

What is it?



PERMACULTURE

Some crazy hippie thing?



PERMACULTURE

Just about gardening?

PERMACULTURE:

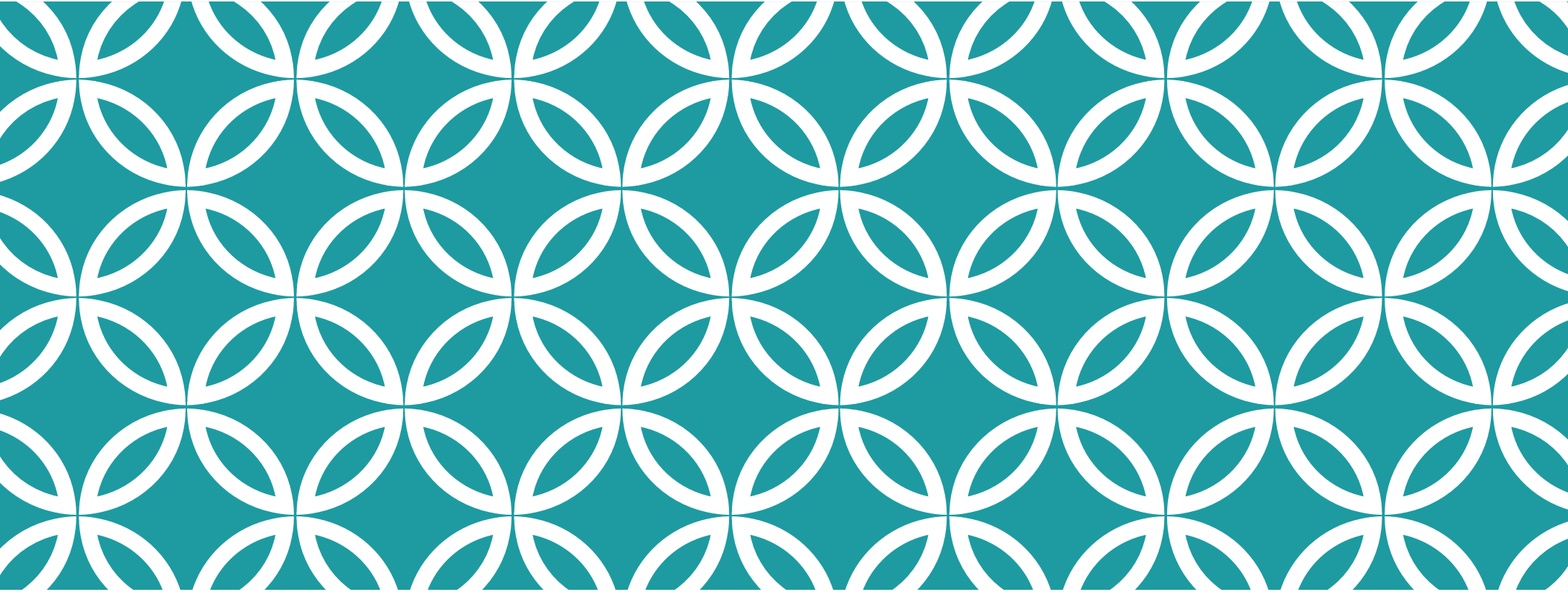
Permaculture (PERMANent CULTURE) is an **ethics-based design science** that aims to help us create indefinitely sustainable systems using natural systems and principles as a model.

- CARE OF THE EARTH
- CARE OF PEOPLE
- RETURN & REINVESTMENT OF SURPLUS

PERMACULTURE

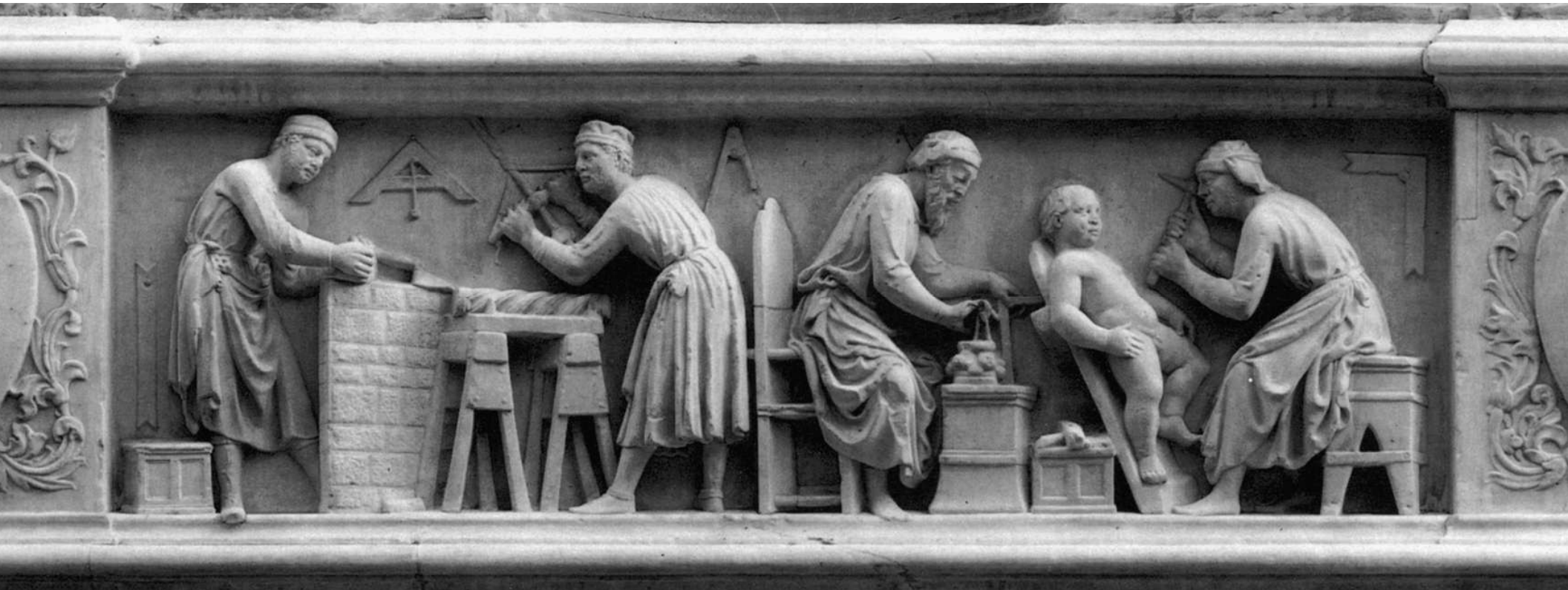
So in this sense:

- Permaculture itself is context-neutral
- Specific techniques – swales, food forests, guilds etc. – are HIGHLY context-specific
- Tools vs. Toolbox vs. Rational Thinking



GUILDS

The Lowdown



GUILDS

What Are They?

GUILDS



(Reiter – if you ever see this, please don't hit me with that giant freaking sword... love you, man)

GUILDS IN ECOLOGY

IN GENERAL tend to refer to EITHER:

➤ A set of mutually interdependent plants and animals (i.e. they have the same or similar environmental needs)

OR

➤ A group of species with similar food or resource requirements (e.g. the guild of egg-eating reptiles, etc.)

The term has been used in other ecological contexts as well...

GUILDS IN PERMACULTURE

Bill Mollison:

“...an harmonious assembly of species clustered around a central element (plant or animal). This assembly acts in relation to the element to assist its health, aid our work in management, or buffer adverse environmental effects.”

- *Permaculture: A Designer's Manual*

Toby Hemenway:

“...a group of plants and animals harmoniously interwoven into a pattern of mutual support, often centered around one major species, that benefits humans while creating habitat.”

- *Gaia's Garden: A Guide to Home-Scale Permaculture* (2nd Ed.)

GUILDS IN PERMACULTURE

Typically not well-defined or explained

Tends to be over-simplified and glossed over

Exceptions:

[Dave Jacke & Eric Toensmeier](#), *Edible Forest Gardens*, vols. 1-2

[Wayne Weiseman et al.](#), *Integrated Forest Gardening*

GUILDS IN PERMACULTURE: THE BASIC IDEA

Creating garden systems that:

- Are modeled on natural systems
- Provide much of their own inputs
- Create stability & resiliency
- Lessen the need for human interventions
- Provide yields for people and wildlife

(More clarification on this later)

GUILDS: UNDERSTANDING RELATIONSHIPS

3 Main Types of Guilds:

- Community Function Guilds
- Mutual Support Guilds
- Resource-Partitioning Guilds

Design from patterns to details – these 3 guild types help us narrow down our plant selections

COMMUNITY FUNCTION GUILDS

Sets of species that share the same community niche: similar behaviors, architecture, food requirements, light requirements, etc.

Right Plant, Right Place!!!

Helps us create our basic list of plants to choose from

MUTUAL SUPPORT GUILDS

The “classic” Permaculture Guild

Groups of species with *different* community niches which form networks of mutual support

The needs of one element in the system are met by the products, behaviors, or functions of another.

FUNCTIONAL INTERCONNECTION

MUTUAL SUPPORT GUILDS

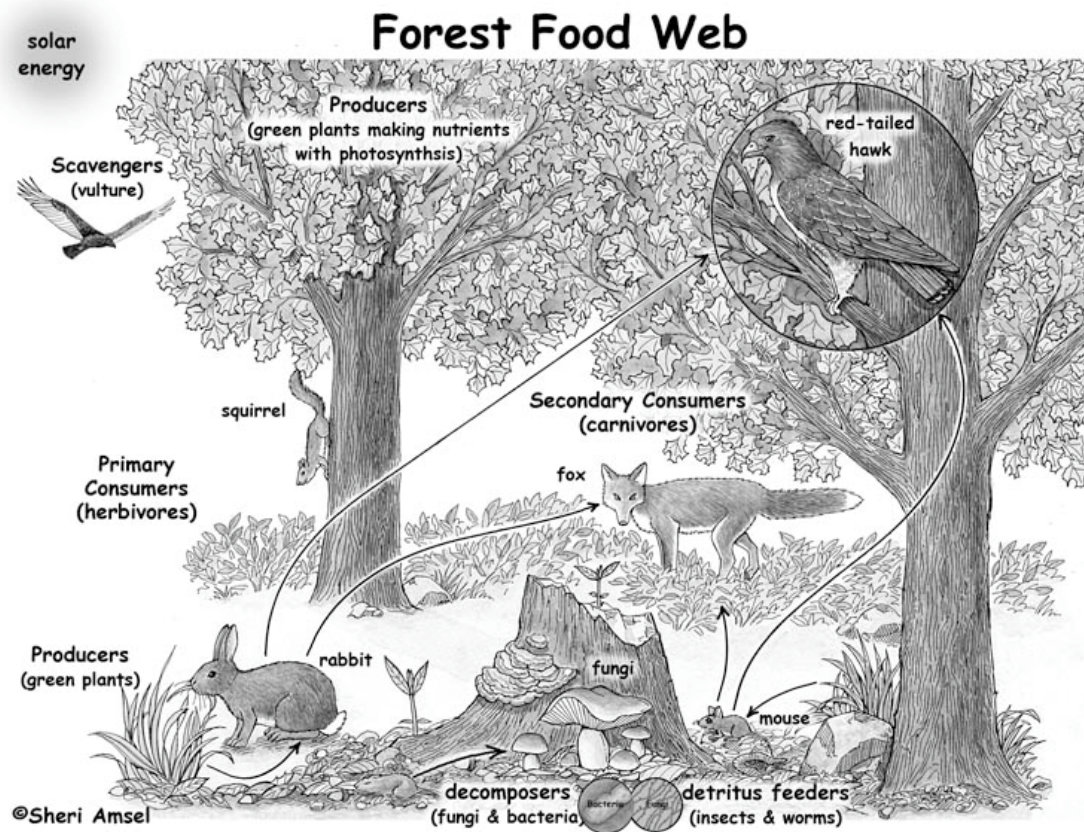


Image downloaded from

<http://www.exploringnature.org/db/detail.php?dbID=2&detID=1212>

MUTUAL SUPPORT GUILDS

Niche: the way a species makes a living in its environment, e.g. the role it plays in a community.

- The sum total of its characteristics, behaviors, functions, needs, products, threats, etc.
- Leads to a more complete understanding of the organism itself and how it fits into the ecosystem.
- Helps understand community function, how it might partition resources, and what other organisms it may interact with and how it may benefit from those interactions or how other plants may benefit from them.

MUTUAL SUPPORT GUILDS

EUROPEAN PEAR (*Pyrus communis*)

Core strategy: An animal dispersed competitive stress tolerator of sunny mid- to late-succession woodland canopies

Context:

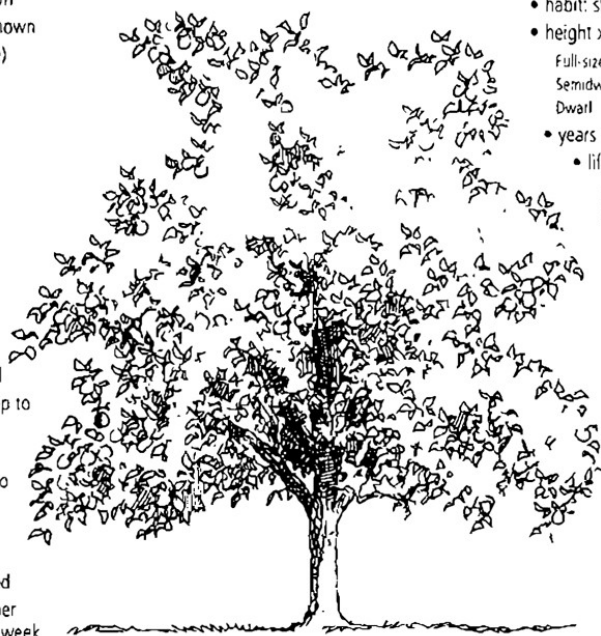
- native region: temperate Europe, W. Asia
- native habitat: unknown
- native associates: unknown
- family: Rose (Rosaceae)

Predators:

- generalist herbivores
- codling moth
- pear psylla
- fireblight
- pear scab

Needs, tolerances:

- full sun
- soil pH 6.0–6.5
- hardiness zones 4–9
- moist, well-drained soil
- prefers moderately deep to deep soils
- tolerates clay
- prefers soils with low to moderate nitrogen content
- high calcium demand
- yields best when pruned
- needs 2–3 gal. water per sq. ft. of root zone per week
- cross-pollinators needed



Characteristics:

- form: upright tree
- habit: standard tree, flat-rooted with sinkers
- height x width:

	feet	meters
Full-size	25–40 x 25–30	8–12 x 8–9
Semidwarf	15–20 x 15–20	5–6 x 5–6
Dwarf	10–15 x 15	3–5 x 5
- years to bearing: 4–7
- life span:

Full-size	50–75 years
Dwarf	15+

Products:

- fruit: pome; late summer and fall ripening
- yield:

	bushels	liters
Full-size	2–4	70–140
Semidwarf	0.5–1.5	18–36
- white flowers spring
- glossy green foliage
- moderately dense to dense shade

Functions, behaviors:

- animal dispersed
- can naturalize
- flowers may die in early frosts
- leafs out after flowering
- drops leaves midautumn

Image from *Edible Forest Gardens, Vol. 1*
©2005 Dave Jacke and Eric Toensmeier

FIGURE 4.1. Niche analysis of the European pear (*Pyrus communis*).

MUTUAL SUPPORT GUILDS

Asteraceae – the Aster Family

Asters, Daisies, Sunflowers, Dandelions,
Yarrow, etc.



Apiaceae (Umbelliferae) – the Carrot Family

Queen Anne's Lace, Dill, Fennel, Celery,
Parsnips, etc.



MUTUAL SUPPORT GUILDS

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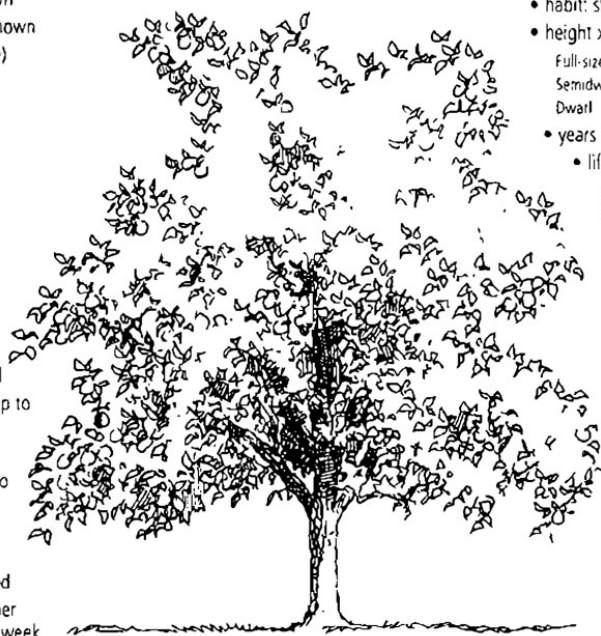
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©2005 Dave Jacke and Eric Toensmeier

FIGURE 4.1. Niche analysis of the European pear (*Pyrus communis*).

MUTUAL SUPPORT GUILDS

Functional Interconnection

- Elements in the system benefit each other through their inherent niche characteristics

Multiple Functions

- Each element in the system serves multiple functions (3+) – creates efficiency

Functional Redundancy

- More than one element in the system can fulfill a desired function – creates stability and resiliency

MUTUAL SUPPORT GUILDS

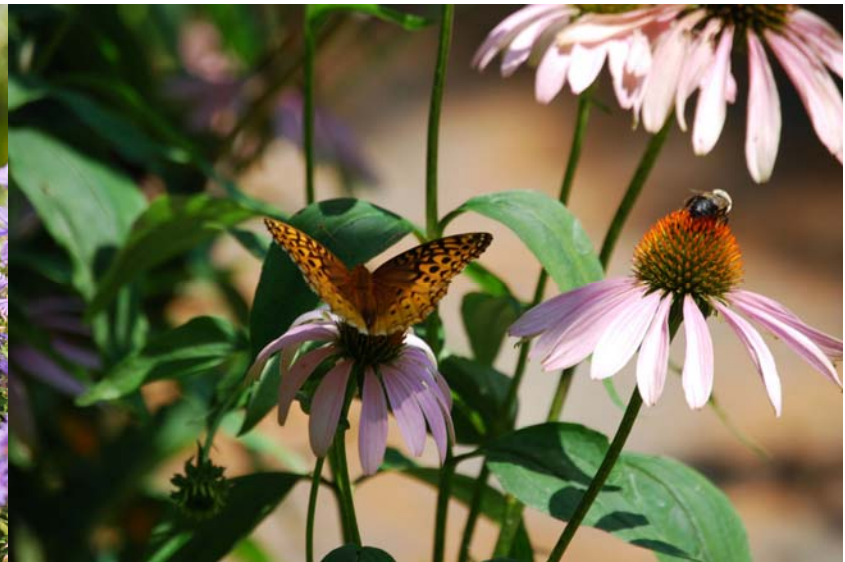
Things to look for:

- Plants that provide useful products
- Beneficial insect attractors
- Aromatic Pest Confusers
- Fertility Enhancers (N₂, DA)
- Habitat Providers
- Groundcovers
- Any other ways we can innovatively prevent or solve problems, and meet needs

RESOURCE-PARTITIONING GUILDS

Sets of species that share common resources or use them in different ways, at different times, etc.

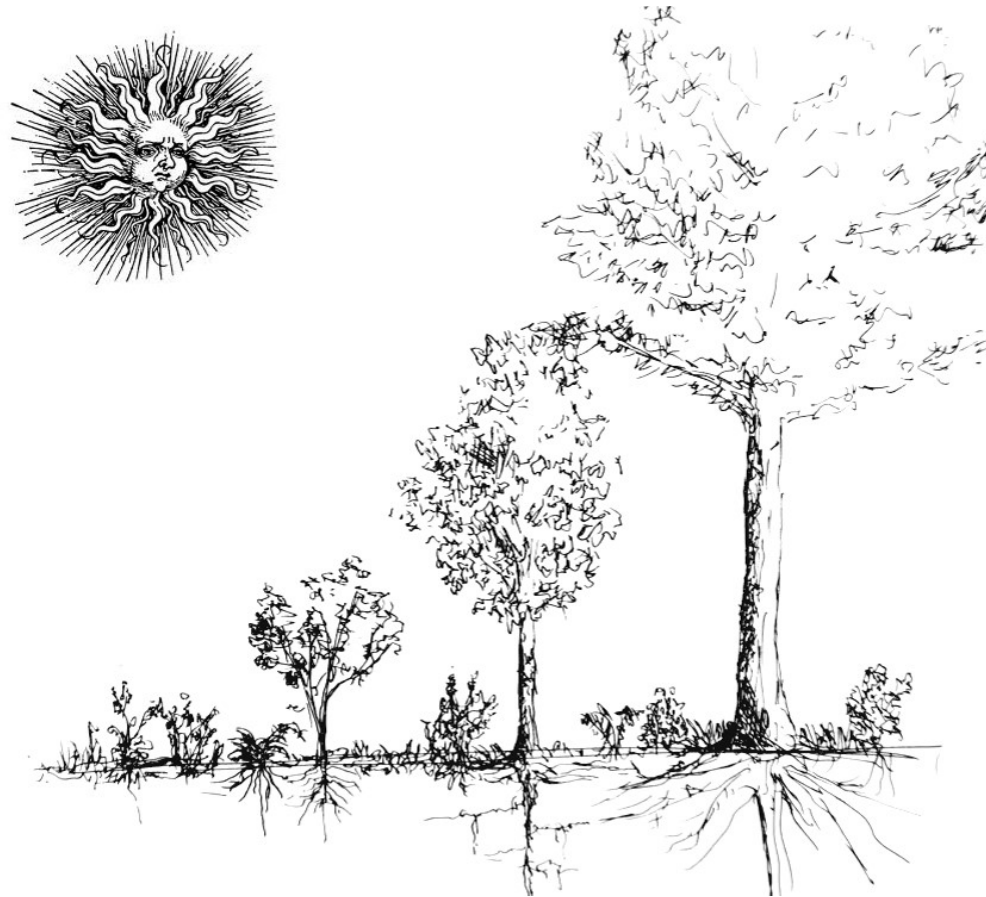
Niches can overlap but do not lead to competition



RESOURCE-PARTITIONING GUILDS

Resources:

- Light
- Water
- Soil Space
- Nutrients
- Pollinators
- Etc.



RESOURCE-PARTITIONING GUILDS

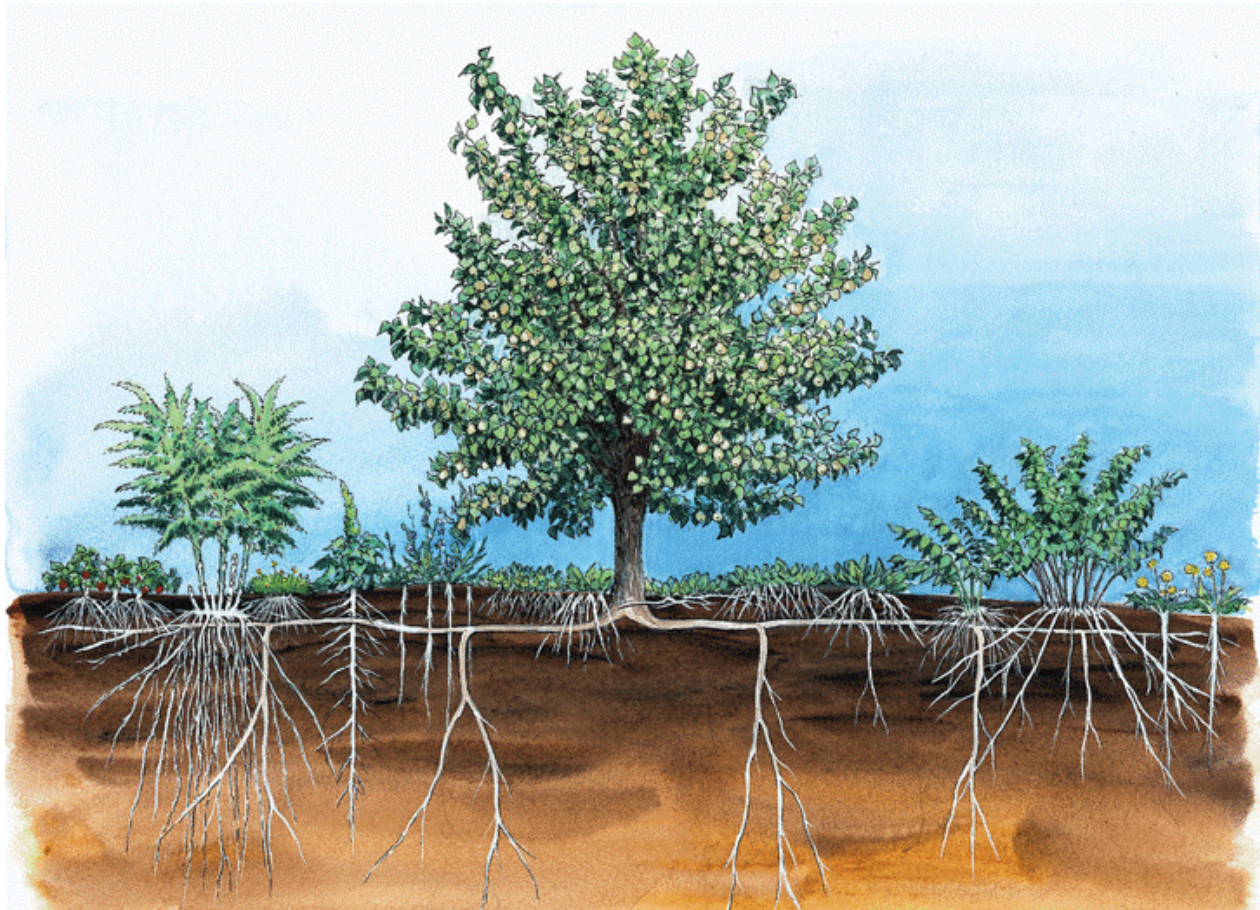


Image from *Edible Forest Gardens, Vol. 1*
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RESOURCE-PARTITIONING GUILDS

All other guilds perform BEST when they are designed to ALSO be resource-partitioning guilds

Functional Redundancy (again) – plants that perform the same or similar functions but do so in a different way

Adds resiliency and stability to the entire system because all elements are able to meet their needs

Minimize competition, Maximize cooperation

PATCH GUILDS VS. GARDEN-WIDE GUILDS

Patch Dynamics

Guilds vs. Polycultures:

- Guilds – Beneficial functional relationships between species
- Polycultures – many species growing in one place

PATCH GUILDS VS. GARDEN-WIDE GUILDS

Wild Blackberry (*Rubus* spp.)



Dikrella cruentata



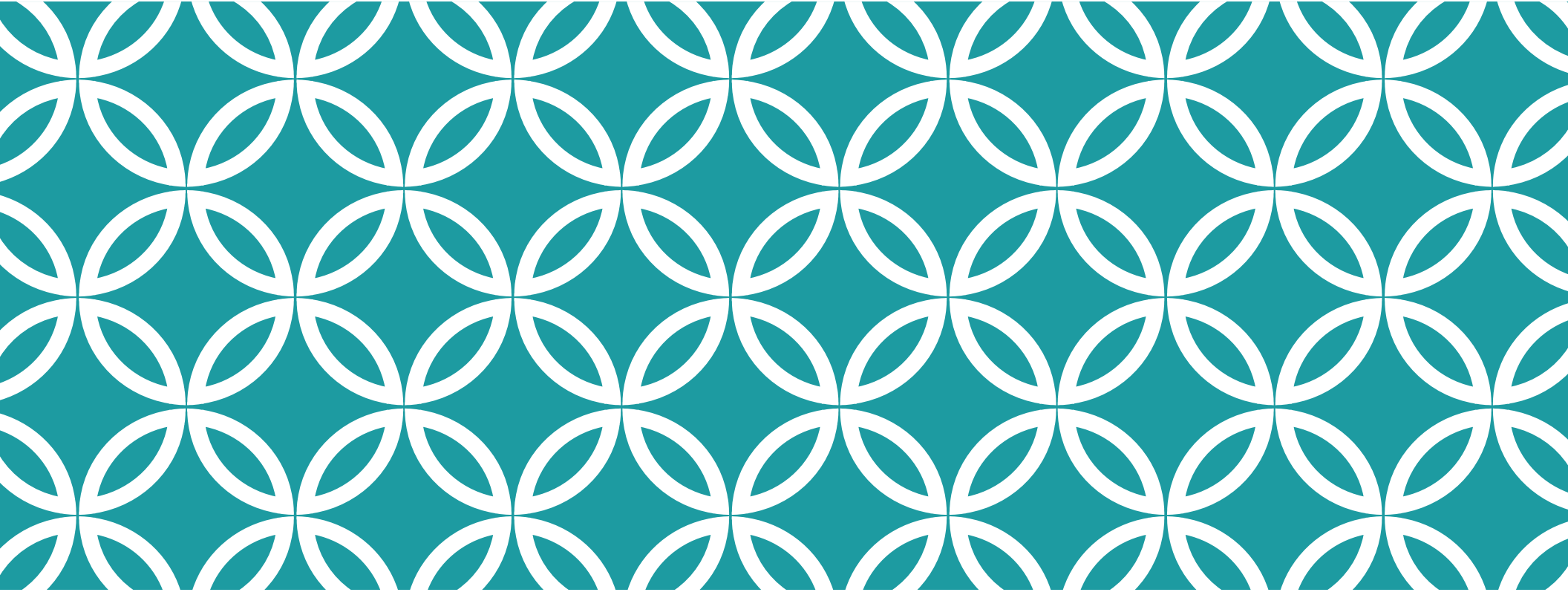
Anagrus epos



Wild Grape (*Vitis* spp.)



Erythroneura elegans



PUTTING IT ALL TOGETHER

Designing Effective Guilds

1. ARTICULATE YOUR GOALS

YOU are the most important member of your guilds!

Fully understand your needs, your wants, your abilities

What is your situation and how might it change?

CAREFULLY AND FULLY DEFINE WHAT IT IS YOU ARE SETTING OUT TO DO



Goals

The **desired results** of a goal are the specific plans and commits to achieve the end toward which effort is establishing specific, realistic time-targeted objectives.

2. UNDERSTAND YOUR SITE CONDITIONS

Site Analysis & Assessment

Scale of Permanence:

- Climate
- Landform
- Water
- Legal/Social Issues
- Access & Circulation
- Vegetation & Wildlife
- Microclimates
- Buildings & Infrastructure
- Zones of Use
- Soil Fertility & Management
- Aesthetics

3. DESIGN CONCEPT

Summarize observations from goals & site analysis

Organize ideas

Come up with a “Mission Statement”

Guides the rest of your design



4. SCHEMATIC DESIGN

Bubble Diagrams

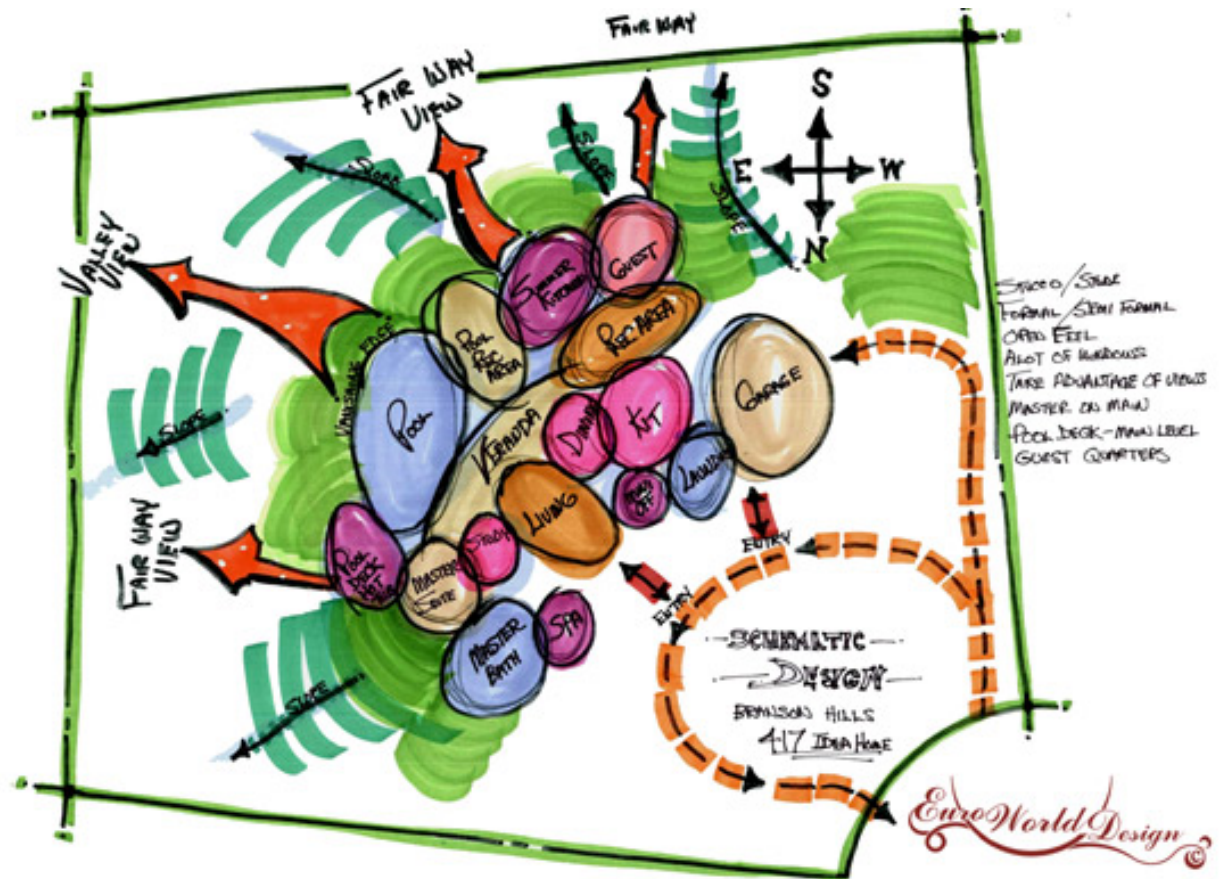
VERY General

Rough Layout

Focuses on relationships among major elements

Patterns, not details

Start thinking about patches & garden-wide relationships



5. DETAILED DESIGN

Refine schematic design into a more accurate layout

Accurate and to scale

Generate Community Function Guild lists of species

Summarize criteria for further species selection

Placement of major elements, trees & shrubs etc.



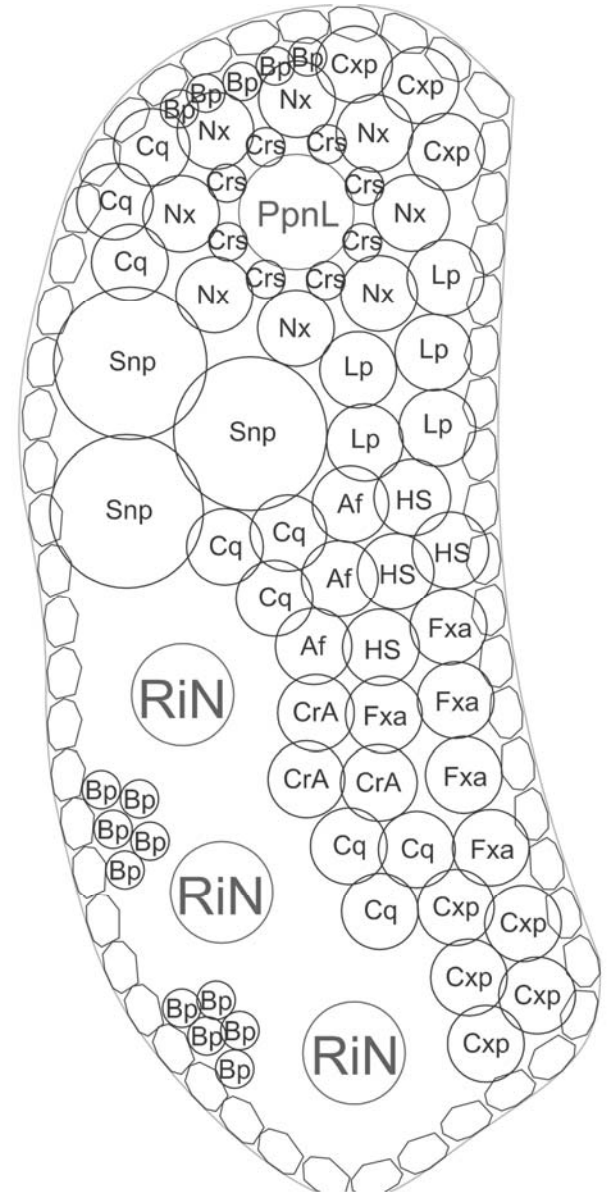
6. PATCH DESIGN (GUILD DESIGN)

Detailed design of each individual patch/guild down to individual trees, shrubs, vines, perennials etc.

Narrow down species selection from Community Function to Mutual Support

Finalize by checking guilds as Resource-Partitioning

Construction Documents





LET'S WRAP THIS UP

Shall we?

**GEORGE MASON UNIVERSITY
OFFICE OF SUSTAINABILITY**

green.gmu.edu

foodforest.gmu.edu