Beacon Food Forest - Forest Stewardship Series - Session 1 in 3 part series

Timing : 5 hours **Location**: at the Food Forest site and Classroom if needed for weather and focusing	*This curriculum was made possible in part by a grant from the King Conservation District* *Authors: Jacqueline Cramer, Kimberly Leeper, 2016*

Three Main Knowledge Themes: Intro to Permaculture and Food Forests; Ecology and Soil Basics; and Site Analysis & Assessment/Knowing your site better

Teaching techniques: CONNECT, ABSORB, and DO

Topic and supporting **materials**	**Details** **COLOR KEYS: Different colors for different instructors and breaks; colors are used for ease in referencing this material.**	**Time Allotted**	**Who Will Lead**	
1. Welcome and Housekeeping Provide handouts Put schedule on the board	**Goal**: Participants will be understand how to navigate the logistics of the day, including orientation to the space **Welcome Everyone.** Instructors introduce ourselves: our experience in coming to the food forest, our inspiration on why we do it, and our knowledge base. Share bathroom locations; clean up at end will involve everyone. Explain that handouts will be guides of how class will progress, and any other pertinent information. Share schedule of the day. Hand out slips of paper, or index cards to participants and explain that they can keep track of their questions on them; time will be made for questions.	**~5 min.**	**All Instructors and administrator**	
2. Group Intros - **Share and Connect** **Post the Homework - 1-page Bio Posters around Gathering**	**Goal**: Participants will have the practice and understanding of assets and needs exercise, and the synergy that can be created between two units. Participants will make some connections with a few people in the class. **BRIEF INTROS:** Each person says their name, where they are from (town and neighborhood), and what they most want to learn through this series. **10 MIN – will depend upon # of people**	**30 min.** (10 min for quick intro and 20 for Assets & Needs)	**Instructor B**	

Plaza (Painter's Tape and Push Pins) GET UP & MOVE (DO)	Then **GET TO KNOW EACH OTHER A LITTLE DEEPER – EXERCISE** - **<u>Assets and Needs Activity.</u>** – **2O MIN MAX** Introduce the activity and mention that we also use this exercise to analyze assets and needs when considering elements in the landscape and planting food forest plants. Each person gets a large index card. On one side they write their assets (strengths/what they have to offer) and on the other side, write their needs at this time. Give examples for each. Then, make two lines of people lined up across from each other. People make pairs: each person pairs with the one across from them in line, and reads each other's ASSETS and discusses. Then each person takes a turn to read the other's NEEDS. In the sharing, people make connections. After a few minutes, all people in one line steps aside to shift the pairings, and new pairs are created. New pairs discuss again ASSETS and NEEDS. The line repeats the shift to make new pairs until everyone has met 4 -5 people.			
3. Get to know Audience's Understanding of Permaculture and experience working in community Create an atmosphere of learning and sharing; instructors learn about students' knowledge and history w/ the food forest Board to write on Convey KCD Grant and Stewardship	**<u>Goal</u>**: Participants will understand the trainings within the context of the region's soil and water conservation and the need to spread the skills and knowledge **Ask question. Who…** • Can define Permaculture? • Has Sheet Mulched? • Has created a Fruit Tree Guild previously? • Heard of Perennial Vegetables • Knows the optimal range of soil ph for plants to grow? • Worked as a volunteer at work parties in the landscape? **<u>Background and Logistics :</u>** Background on our Food Forest – ask students to share what is this project? List key words on the board. Give Background of the reasons for these trainings: this project needs leaders who have skills, feel empowered, and will take initiative to make projects happen, solve problems and look for what is needed. Give examples: watering plants, project leads, looking after the site and the community by observing. Do you see a project that needs to be addressed? This training will give you knowledge and familiarity to be empowered to address it. **<u>Goal</u>**: Students realize how much they are valued and that they have a place. Participants will understand the context of the training within the food forest project <u>BFF goals</u> – to gain new leaders who know what needs to be done, feel empowered and comfortable to act; take on initiatives which take care of the food forest and teach others <u>King Conservation District (KCD)</u> provided a grant to fund the	**20 min.**	**Instructor A** **Administrator**	

Series Goals Refer to **handouts** that address return service ('payback') hours	stewardship training series. The goals for the grant are to: build soil, conserve soil and water, ripple the effect of knowledge and practice to community, create models to follow, repeat at other sites, document it for others and put on website. The Logistics of the Stewardship Program – • 3 classes = a total of 15 hours of instruction. Repeat the dates and times • Return Service hours: participants will return 15 hours of service in exchange for the education. A deposit is collected to motivate participants to complete the hours. For the first five hours, all participants are asked to lead at a work party (you will be mentored) • Additional return service options – discuss generally: take a lead at 2 more work parties, or organize a project: • by second class bring idea of where/how you want to do 'pay back' service hours. How to keep track – reporting to grant administrator. Cover details for tracking hours and reporting them. ***Review Participation Agreement and have each sign it*** OVERVIEW OF CLASSES class one – Intro, expectations, ecology, soil, and field walk/site analysis & assessment class two – community, diversity, leadership, funding, water, tools, plant tree guilds class three – more on plants, community, work party leads, and managing perennial systems **GOAL** - Participants will understand expectations of them for attending class, returning credit service hours, and keeping track with administrator			
4. Setting the Anticipatory Set for Permaculture - Show a video and/or demonstrate the beginning of a BFF Work Party	**Goal:** Participants are inspired by either: ■ a video of permaculture the describes the role of permaculture in healing the planet and providing solutions for our societies. And/or ■ energy and excitement of a work party, realizing that they will be involved as key players at the end of the training series. Either: • Show a video of permaculture intent and origins, or a video of a mature food forest. The video should have permaculture basics mentioned and inspire people to learn it and get involved. Example: David Holmgren Holmgren explains how you can change the world with permaculture: https://www.youtube.com/watch?v=TVS45dbNL-E	**15 min.**	**ALL**	

	OR • Role play the beginning of a work party. Provide orientation to the site and the tasks. Work party check list guides the set up. Show how we build community and get work done. Introduce and use **some permaculture ethics and principles in action and show them in action. For example: 'value diversity and integrate rather than segregate': at the work party find those with experience and pair them with inexperience when doing tasks**			
5. What is Permaculture? Show poster of principles centered around the ethics. (refer to handouts, poster) Use as A VISUAL AID FOR ALL SESSIONS	**Goal** – students understand an introduction to permaculture history and guiding ethics. Principles guide the design process. Students understand the science and philosophy of and the techniques and methods used to create the food forest. **Permaculture** is a system of agricultural and social design principles centered around simulating or directly utilizing the patterns and features observed in natural ecosystems. It is an ethical design science that helps us to design human spaces that are in tune with nature, create inter-relationships, and provide functions for ecosystem health, diversity, and abundance. It is a View of the world as whole and inter-related. Some **history** of Permaculture – a body of knowledge compiled by Australians Bill Mollison and David Holmgren in the 1970's. It is a dynamic discipline with evolving ways to describe it. Yet, it admits it is not new, but a thousands-year old while also being a cutting-edge practice. It mimics nature and learns from indigenous societies. **Permaculture Ethics** – 1) Earth Care 2) People Care, and 3) Fair Share, sometimes articulated as Distribute the Surplus. These ethics guide our goals, our visions, and our actions. **Permaculture Principles are used to guide us.** Your hand out includes those articulated by David Holmgren, and we are seeing a variety of other principles being offered in permaculture community. They are similar to each other and intend to convey the same messages. We will refer to these as we go, and we will emphasize a few of them early and often: • **Observe and interact** – take time to watch the place and people for whom you are designing. Interact a little and then step back to watch. Don't just impose solutions. • **Use slow and simple solutions** – give examples of the nearby project and nature doing the same. • **Use and value diversity** – the varying plants, people, and elements will create a resilient and responsive community, project, and living system.	**15 MIN**	**Instructor C**	

	The bottom line is that permaculture is a road map to finding our small place in the world as an integral part of the whole planetary system.			

Ecology offers a broad and holistic context to understanding natures systems.
 	
Activity for defining terms
 	
Ecosystems
	Goal – Participants understand basics of ecology: holistic perspective, cycles, ecosystems, inter-relationships.
	
	Ecology If we had to use only symbols and sketches to show ecology, we would find use arrows and circles within cycles. It would show plants and clouds and soil and critters and minerals and soil and air. Is there anything you would add (have someone sketch these things as you speak and share.) Humans are a part of these cycles.
	
	Preface/Context – In designing for human use in permaculture, we must observe and mimic nature. Using ecology will help give us a basis for understanding nature.
	
	Ecology is the science of looking at living organisms and how they interact with and relate to each other in the habitat in which they live. Its spectrum is vast, from small organisms to large.
	
	Ecology addresses relationships and connections.
	
	Thinking in this context gives us a broad and holistic perspective. Ecology encompasses many specialties including biology, ocean physics, climatology, botany soil science and more.
	
	• Define terms activity– Hand out slips of paper with definitions and ask students to match their definition with their word that is on the board. At end of this section, hand out sheet with definitions to be matched to terms. a simple exercise.
	  • niche
	  • ecological succession
	  • bioregion
	  • biodiversity
	  • polyculture
	  • biomass
	  • climax communities
	  • limiting factors
	  • edge
	  • stability
	
	Ecology integrates all of these and studies interdependence and inter relationships
	
	ECOSYSTEMS carry out functions for life processes. We don't
		15 MIN	**Instructor A**	

functions	fully understand or know all details. Many cannot be replicated by humans. When we destroy or weaken ecosystems we undermine life processes. Discrete packages of ecosystems don't exist; it is all inter related. Humans are the main disrupters of ecosystems. • Some ecosystem functions: *clean water* thru: oxygenation, wind, plants soil; (waste mgt and water supply) *prune plants* with animals, wind, insects; *fertilize soil*; *sterilize* with sun; *seed dispersal*/ genetic regulation; **Q - Can we name other ecosystem functions?** habitat/shelter, food**,** pollination, biological control, etc. LIST ON BOARD			
7. Define Food Forest Refer to Handout In Binder Intro to Food Forest	**Goal:** Participants understand the benefits of food forests, the basics of the architecture, and some functions of food forests. **Engage participants and see what they know: Ask 'How do you define a food forest?'** Record on a board participant responses and see if they got all of the pertinent information. **REVIEW IMPORTANT POINTS** --Food Forest **mimics** a forest, made up of mostly perennial plants. --Its **structure** or architecture comprises **7 layers:** Large trees, small trees, shrubs, perennials, ground covers, bulbs/roots, and vines. The understory layers capture the sunlight energy that passes by the upper canopy, and use that energy to conduct photosynthesis, building plant matter. **--Outputs**: The food forest provides food, fuel, fiber, fertilizer, fodder, "farmaceuticals " (natural medicines), and fun as listed by Dave Jacke, author of Forest Gardening --***Benefits** – High Productivity; Natural Mulch, Fertilizer, and Compost; Resilience through Biodiversity; Natural Pest Control; and Easy Soil Repair **--Units**: food forests are made up of several Fruit Tree Guilds which have Structure (Stacking Plants in Layers) and Function (Nitrogen Fixing, Mulch Maker, etc.) --Design of food forest emulates **Patterns** of Nature – show examples of several of them. These include: spirals (snails, rams' horns), meanders in pathways to slow flow down (comparable to river meanders), etc **--Design Locations** of plants - Generally tall trees are planned on the north or east sides of garden with smaller plants to the south or west of them for maximum sun.	**20 min.**	**Instructor C**	
8. Review initial topics -	Review key concepts of morning and take some questions from the those they wrote on index cards as day is going by.	**15 min.**	**ALL**	

Q & A Time				
9. LUNCH	Lunch Break – Potluck Lunch (communicate this via email prior to class) Toward end of lunch, explain to the full group how stations will work. Then break into 3 groups that will rotate through 3 stations (each = 30 minutes long)	**30 min.**		
10. SOIL BASICS Healthy Soil is basis of good plant growth and other ecosystem benefits *Soil Test sampling (shovel and handout) , Soil test Results* The soil jar method, pH testing and digging a soil profile are basic steps for people to understand	**Goal**: Participants are introduced to components and players in the soil. Students become familiar with ways to deconstruct and understand soil. They understand that fungi have a key role in healthy soil life, necessary to the health of the food forest. EXPLORE SOIL BASICS WITH CONCEPT DISCUSSION AND HANDS ON - Soil is diverse habitat. We manage it as an ecosystem. In between soil particles is where the action is – water, air, and microbes! **DEFINITION OF SOIL-** The crust of earth consisting of disintegrated rock and humus (decomposed plant material); influenced by rock (minerals), climate and topography over time *(different horizons of soil layer upon themselves over time)* **Healthy soil performs functions** – Take student input and list on board: ***Soil Functions:*** --a medium for plant growth --recycling of nutrients and organic matter --water supply and purification --habitat for organisms --engineering medium --modifier of atmosphere **(carbon sequestration in soil)** **ACTIVITIES** 1. **How to take a soil sample for testing -** handout and demonstration either on site or in a series of projected images. 2. **Review a sample of soil test results** COVER THE FOLLOWING POINTS: PHYSICAL PROPERTIES OF SOIL will dictate everything from drainage, to nutrient-holding capacity of soil. Terms: a. **Soil pH** This is a measure of the soil acidity or alkalinity and is sometimes called the soil pH. **Soil pH is the foundation of essentially all soil chemistry and nutrient reaction and should be the first consideration when evaluating a soil test**. The total range of the soil pH scale is from 0-14. Values below the mid-point (pH 7.0) are acidic and those	**15 min (if time – 40 min)**	**Instructor A**	

their soil type and what it means for growing . and how to treat the soil – ex - avoid compaction *Handouts* Soil life and the soil food web helps students understand what is going on in soil Visualization helps create student connections to the life in the soil	above pH 7.0 are alkaline. **A soil pH of 7.0 is considered to be neutral.** Most plants perform best in a soil that is slightly acid to neutral **(pH 6.0-7.0).** Some plants like blueberries require the soil to be more acid (pH 4.5-5.5), and other, like alfalfa will tolerate a slightly alkaline soil (pH 7.0-7.5). **HANDS ON ACTIVITY – have all participants with hands in soil and share observations on the concepts.** b. **Texture –** Relative amount of sand (coarse particles), silt (fine particles), and clay (super-fine particles) of the soil; SHOW SOIL TEXTURE CLASSIFICATION CHART (Pyramid – USDA). Use jar test to show the materials which would make different textures. Ask students in groups to do conduct a jar soil test, sorting thru the soil and adding it to jar and adding water. Before they add water, explain. **c. Consistence** –How loose, light and airy OR compacted soil is; the feel of soil and ease with which a clod can be crushed by the fingers. Have students feel the soil, and explore this. d. **Profile/Horizon** – Dig a hole up to 2 feet deep to expose different layers in the soil, and have students observe soil horizons e. **Macronutrients** – Nitrogen, Phosphorus, Potassium, etc. f. **Micronutrients** – Boron, Copper, Iron, Chloride, Zinc, etc. BIOLOGICAL COMPONENTS OF SOIL Organisms in the soil are referred to as soil life. They are alive and make the soil a dynamic place. They consume and produce. They are essential building blocks of the soil food web. They consume organic matter, so can increase their health by adding organic matter, leaving leaves, and reduce disturbance VISUALIZATION – (*If time allows in the schedule*) Picture yourself as one organism in this list of organisms (list on the board so they can choose) in our story of the journey through the soil. You are living a pretty good life on an organic farm and make your way into the bottom of a potted seedling in the nursery of the farmer. You inadvertently travel away from the farm in that pot and are sold at the farmer's market to an eager, new gardener who wants to grow vegetables on the farm. *Embellish the story to tell how the organism makes its way into the backyard urban garden.*			

The use and benefits of fungi in perennial systems	Once in your new home, you are hungry, seeking out small bits of organic matter that is left in the soil. It is tight, compacted and quiet. There are a few roots around you and they seem to be mining minerals from the sub soil – dandelions are carrying calcium to their leaves and the soil's surface; plantain roots are carrying phosphorus up. You make your way to the fine, tiny hairs of the roots of these plants to see if you can find some action. T**he importance of history in understanding a site's soil**: this backyard urban yard or park was under someone else's care. For years, they removed all the leaves that fell, and all garden vegetation that was trimmed and pruned. They used petroleum-based fertilizers to provide immediate nutrients for their ornamental hedges. They applied herbicides and insecticides. The results were very damaging to the soil and you landed in a near desert. (read from text – Gaia's Garden – volume one p. 66, Toby Hemmenway) SOIL ORGANISMS: The soil food web is alive and full of active players. They need food to survive and in turn provide food for others. Mostly, the soil life is breaking down organic matter in some form or the other and the exudates from their biological process help make up soil structure and in turn, ionic charges on the surfaces of soil particles. ***The players and processes are many:*** List on overhead: PLAYERS: bacteria, nematodes, fungus, macroarthropods, microarthropods, worms, algae. PROCESSES: shredders, bacteria feeders, parasites, decomposers. Humus forms from these activities and it takes a while to create humus structure in the soil. Shovels and tillers destroy humus. As we learn more about this, we understand why we need to reduce tilling of the soil. The star that we support and promote in our food forest is the ***fungi***. They eat carbon matter in the soil – chips, twigs, leaves, plant matter. They travel far and wide to create a network that supports the plants in the ecosystem. The fungi that we know as mushrooms and see are the fruiting bodies of fungi; beneath the soil, the hyphae single roots and root masses, called mycelium, run far and wide to collect water and nutrients that they share with plant roots. Plants provide certain nutrients to the fungi. This relationship is called mycorrhizal and is symbiotic. When you run your hands thru a pile of leaves in the forest			

	and see white strands, you are seeing the mycelium. It shows up to consume the carbon in the organic matter we put on our food forest. The fungi have relationships with the perennial plants and can help them access more nutrients than their own roots can provide. Under dry conditions, fungi can bridge gaps between pockets of moisture and continue to survive and grow, even when soil moisture is too low for most bacteria to be active. Fungi are able to use nitrogen up from the soil, allowing them to decompose surface residue which is often low in nitrogen. Fungi are aerobic organisms. Soil which becomes anaerobic for significant periods generally loses its fungal component. Anaerobic conditions often occur in waterlogged soil and in compacted soils. Fungi are especially extensive in forested lands. Forests have been observed to increase in productivity as fungal biomass increases. Explore fungi in the soil hands-on show fungi and mycelium in soil			
11- 13 Hands-on Stations:	3 STATIONS – ROTATING the 3 groups thru them Three ~25 min. stations, plus 5 minutes after each station to change locations.	T = 90 min	ALL	
11. Station: SHEET MULCHING METHOD of HEALTHY SOIL MANAGEMENT	**<u>Goal</u>**: Participants understand and can repeat the practice of sheet mulching and why it is used. Station 1 - **<u>SHEET MULCH INSTRUCTION AND HANDS-ON</u>** TO COVER THE FOLLOWING CONCEPTS: 1. <u>COMPOST</u> - Compost is loaded with nutrients good for plants, particularly vegetable plants. *<u>Sources</u>* include commercially-produced compost which will heat it to high temperatures to kill parasites and unwanted pathogens. The organic matter revives after that, and soil life cycles revive the soil. Compost from the backyard, created with local matter can be turned in bins. *<u>OPTIONS</u>*: cold or hot piles. Worm bins – use local food scraps and make a potent fertilizer. be aware of rat potential and get a cat. *<u>method –</u>* laying it on top like mulch, turning it in (pros and cons), spot-amending, pockets. 2. <u>AERATION –</u> Create channels by the prying of earth with a garden fork. Nature creates aeration when earthworms and other macro invertebrates move through the soil : when plant roots die and are consumed, when frost heaves the soil. 3. <u>PROPER WATERING -</u> channels flow with water as it infiltrates to lower layers:	**3 X ~25 min. stations plus time to change stations**	**Instructor B**	

Do a sheet mulching demonstration in the classroom or outdoors on site. Materials	as water fills the pore spaces in the soil, plant roots shed organisms travel fungal roots from the distant park travel to capture moisture for the trees and woody perennials they support bacteria, nematodes, organic matter and some small amounts of fungi, present in the well-decomposed compost are making their way into the soil on the nutrient-rich water as it permeates the centimeters in the soil 4. <u>SHEET MULCHING</u> - for the preparing perennial orchard areas of the garden: lay down an organic sheet of wet cardboard, paper or cotton sheets, large leaves) to block light to the grass/weeds, and then lay down a layer of compost, then woodchips to feed the soil and create a new living system for the fruit trees.			
12. Station: TESTING and METHODS of HEALTHY SOIL MANAGEMENT Use hand out to familiarize participants with the process and show how simple soil testing can be. --*Soil Jar Sample* Bring several examples of different plants, and SAMPLES OF	**<u>Goal</u>**: Participants understand methods of soil care and why they are used. Station 2 - **<u>SOIL SAMPLING AND TESTING & SOIL MANAGEMENT</u>** • <u>Soil test for the lab -</u> Review the conservation district hand out on how to take a soil test. Conduct hands on soil sampling. Provide a few links on resources for soil testing [local labs connected to conservation districts and universities] Review a sample soil test together. • <u>Soil Jar Test</u> **–** explain the test: a simple procedure to study your soil's composition. Have students break into small groups and fill a jar with soil and water and shake it, then wait many hours or days. The soil will settle into layers, and we examine those layers to see how much of it is sand, clay, organic matter, silt. The proportion of these in a sample shows you how well the soil is suited to support plants. Refer to handout **<u>OTHER METHODS FOR SOIL MANAGEMENT AND SOIL BUILDING</u>** 5. <u>LEAF MATTER AND ORGANIC MATTER</u> on the beds are left and cover the soil year round, and especially in winter when the heavy rains come.		Instructor A	

different materials or slides (ex biochar, compost tea tools, manure,	6. SOIL-BUILDING PLANTS – •**mulch makers** – plants that create a lot of plant matter in a season and can be cut back frequently and dropped to the ground, forming a layer of organic matter atop the soil. we will cover more of this in the plant unit. •**cover crops**- are used by the farmer to cover the soil from eroding forces and to create organic matter to benefit the biomass and soil. Some fix nitrogen; some add structure (like grasses – rye); some prefer wet soils; some bring nutrients from the subsoil. Pass out table 4.2 from Gaia's Garden p. 76 and review details, take questions. Reference p. 77: Diversity is key to providing a balance of nutrients; fine roots shed when water is infused into pore spaces; and grow again, building soil organic matter, structure in deeper zones, and shedding nitrogen-nodules for other plants to consume. •**plants that add nitrogen** – some plants form a symbiotic relationship in the soil with bacteria that will take the atmospheric nitrogen from the air in the soil, and make the nitrogen available to the plants. (another reason to not step/compact the soil) There are many fruit-bearing nitrogen-fixing plants: Eleagnus spp; seabuck thorn; as well as acacia, alder, pea shrub. 7. MANURE FROM ANIMALS – poop from goats and chickens must be composted/aged, but rabbit manure does not need to be aged. Larger scale areas can use livestock in a rotation on large tracts of land = a method seen in the wild with large herd animals tracked by predators. and taught widely in a method called Holistic Management - by Alan Savory. holisticmanagement.org 8. BIOCHAR - is a material created by pyrolosis, the burning of carbon- based materials (wood, pine cones, etc) at high temperatures and low oxygen. It retains pores/structure and can be buried in the soil to sequester carbon, and house nutrients, allowing for a slow release and resist leaching when rains are heavy. Terra petra is the name of the use of biochar found in the Amazon Basin -used by indigenous people. 9. COMPOST TEA – is created with compost and water. It is essential to use the tea immediately and when creating the tea to incorporate air into the water so you do not kill aerobic bacteria and fungi 10. HUGELKULTUR – piles of wood and branches, carbon matter, are buried in the soil and covered with soil, 'sinking' the carbon. The organic matter acts as a sponge for water, slowly releasing water and nutrients over time. 11. TWIG PILES – from pruning and work on site. They are piled up on site and are great habitat and erosion control.			

	12. REDUCED AND NO TILLING - tilling will break soil structure and release nutrients in the first year. Farms and gardens that have been tilled for decades have soil that becomes a powder that crust over in rain. In <u>One Straw Revolution,</u> Masanobu Fukuoka described no till farming. It has gained attention, practice and research support since 1975.			
12. Station: Tour and Intro to Site Analysis and Assessment of the food forest site Have Stewards record observations on a simple handout	Station 3 – **<u>Goal</u>**: Participants can analyze and give a big picture assessment of the food forest site, given a number of aspects and repeat the process for another food forest **<u>TOUR THE FOOD FOREST WITH HISTORY AND THE LAY OF THE LAND</u>** Cover as many aspects of site assessment as possible: 1. <u>CLIMATE</u> – Plant Hardiness Zone, predicted future climate change status, Annual Precipitation and Seasonal Distribution, Wind directions, Chilling Hrs., Growing Days, Extreme Weather Potential 2. <u>LANDFORM</u> – Slope, Topographic Position, Bedrock and Surficial Geology, Estimated Seasonal High Water Table Depth, Estimated Depth to Bedrock/Hardpan/Impermeable Layers of Soil, Elevation, and Landslide Potential 3. <u>WATER</u> – Existing Sources of Supply, Watershed Boundaries & Flow Patterns, Potential Pollution Sources, Flooding/Ponding/Puddling areas, Erosion 4. <u>LEGAL ISSUES</u> – Zoning Setbacks, Wetland/Water Regulations, Neighborhood Associations, Regulations on What is Planted (No “Invasive” or Plants Susceptible to Diseases) 5. <u>ACCESS/CIRCULATION</u> – Activity Nodes, Storage Areas, Pedestrian/Wheelbarrow/Vehicle Access Points, Current and Potential Patterns for Circulation, Material Flows 6. <u>VEGETATION AND WILDLIFE</u> - Existing Plant Species, Ecosystem Architecture, Habitat Types, Food/Water/Shelter Availability 7. <u>MICROCLIMATE</u> – Define Various Microclimate Spaces, Slope Aspects (direction slope face relative to sun), Sun/Shade Patterns, Cold Air Drainage and Frost Pockets, Soil Moisture Patterns, Local Precipitation and Wind Patterns 8. <u>BUILDINGS AND INFRASTRUCTURE</u> – Building Size/Shape/Location, Permanent Pavement, Power Lines, Outdoor Water Faucets, Septic Systems, Water Wells, Location	**3 ~25 min. stations plus time to change stations**	**Instructor C**	

	of Underground Pipes and Utility Lines, Fences and Gates 9. <u>ZONES OF USE</u> – Property Lines, Existing Zones of Land and Water Use, Current Uses by Neighbors and Passersby, Use History, Current and Future Zones of Use. We will go into more depth on zones in next block of time 10. <u>SOIL FERTILITY AND MANAGEMENT</u> – Soil Types, Topsoil Fertility, Soil Toxins, and Soil Management History 11. <u>AESTHETICS/EXPERIENCE OF PLACE</u> – Outdoor Rooms/Define Spaces, Arrival & Entry Experience, View Lines and Corridors, Visual Integration, Private/Public Continuum, "Sense of Place" (unique elements of site that express and connect one to the place, neighborhood, and region), Disharmonies			
13. Permaculture terms and techniques for Site Analysis **Review Scale of Permanence** after station on site analysis **Or through a matching activity**	EVERYONE COMES BACK TO GATHERING PLAZA – 5 minutes for walking **Formal discussion/description of SCALE OF PERMANENCE** – a sensible ordering device for use in planning. We use this scale to assess the land and the scale prioritizes which factors to address first and after. The scale's factors are inter-related parts of a complex whole that will exhibit dynamic interplay between levels, and the specific order of his scale is hierarchical and based on scales of time as well as energy. We use the scale as a key tool in order to design a food forest on the land. A hand out by Dave Jacke is included the curriculum and we review the scale on the food forest site most important topics to consider for Food Forests – See Dave Jacke handout for more details *(You can use a matching activity – by forming teams and working with terms and definition)* Focus on familiarity with site, soil, and site assessment of BFF Points from ***Practical Permaculture (book by Bloom and Boehnlein)*** - Constraints and opportunities come from this analysis and from the scales of permanence assessment of a site.	**10 min.**	**Instructor B**	
14. Permaculture terms for site analysis **SECTOR**	**<u>Goal</u>:** Participants can recognize a variety of outside influences and assess their impact on the site **SECTOR ANALYSIS** Mollison calls sectors "the wild energies'. Sectors are energy flows moving through a site which originate off site and can't be directly stopped or controlled and affect site or design	**10 min.**	**Instructor C**	

ANALYSIS	area. We want to manage incoming energies so we have to study them first. Natural Sectors - wind and air, fire, wildlife, sunlight, water from off site, and drainage AND not-so-natural – views and privacy, noise, pollution, smells, views, traffic, zoning and codes, homeowners' associations, easements and utilities, neighbors, passersby, commerce, local customs, pets, burglary/street crime, arson, and law enforcement. Larry Santoyo, permaculture designer in Los Angeles, says that "Sectors trump everything" and that if we get the sectors wrong, our design may fail utterly." Sector analysis organizes design elements into useful relationships with outside influences that we cannot directly affect. Rosemary Morrow - Our design will regulate some factors that we want to invite in, others channel, others block. Choose and place design elements…to USE Sectors such as SUN – ex. solar panels where it's sunny; to BLOCK sun – ex. shade tree; and EMBRACE current site conditions - planting shade-loving plant under a mature conifer.			
15. Permaculture technique **Zones: Sketch zones, and engage students**	**<u>Goal</u>** – Participants recognize zones as a key tool in laying out the food forest, and understand some examples. **Zones –** activity to demonstrate zones of use and their use in BFF design Zones are used in permaculture design to locate elements according to their frequencyof use. Zone 0 = the household, Zone 1 = the area right outside the door, used every day and many times a day, example of items located here: worm bin. Zone 2 = a little further out and used regularly example of items = chicken coop, Zone 3 used less frequently yet; zone 4 used less often, Zone 5 = wild areas. In a food forest, plants that need a daily harvest are placed in zone 1 and along busy pathways. Plants that are tended infrequently and do not need to be harvested under crucial time periods can be placed in zone 3 or 4. Ask students for some examples to get them using the concepts.	**10 min**	**Instructor A**	
16. REVIEW THE DAY	Share clearest and muddiest points of the day. Ask students to share and write on the board. IF time allows, answer some questions and plan to address the muddy points further in the next lessons. Teachers review most important 3 points of the day and give a preview of next class: Building Community, Leadership, Plant Tree Guilds, Grant Writing, Outreach, Water, Wetland, etc.	**30 min**	**ALL**	

	Homework due for next class – write a Plant Profile, of a perennial edible plant: include a sketch or photo, conditions it thrives in, pests, harvest time, how to use the plant parts.			