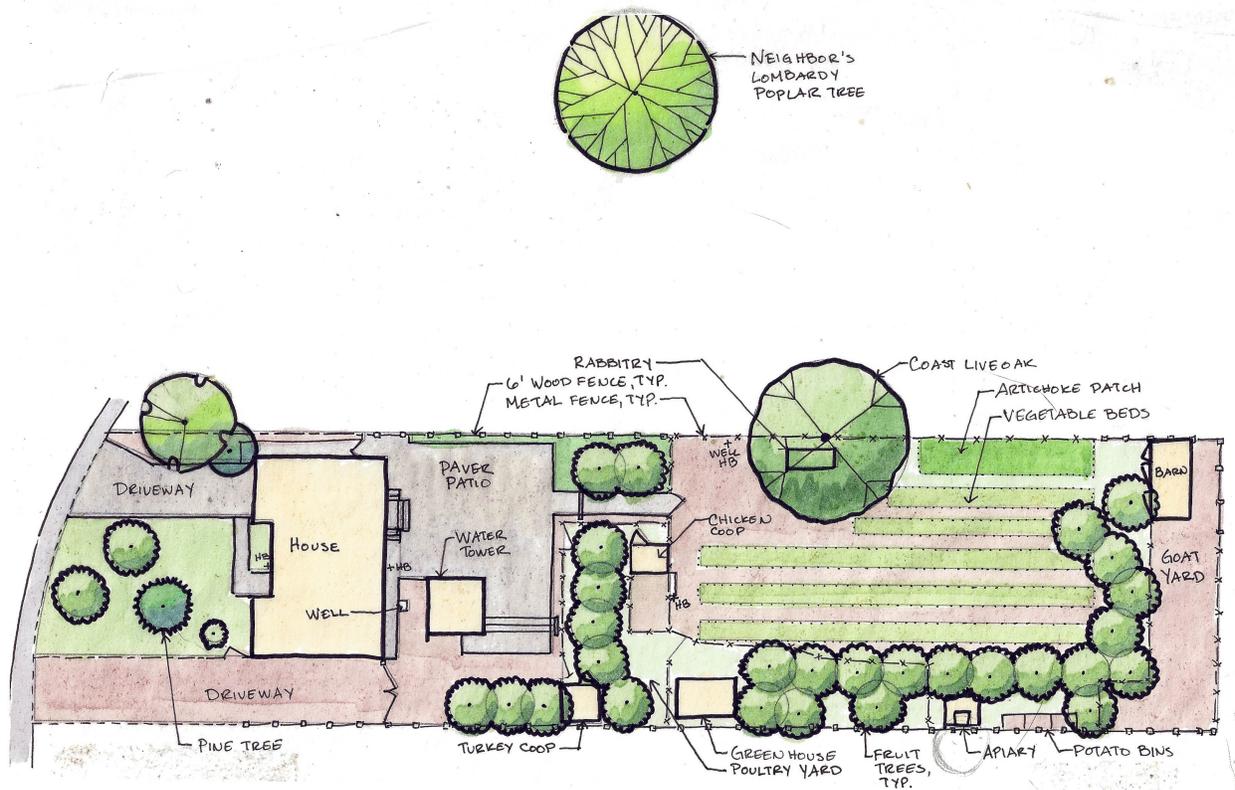
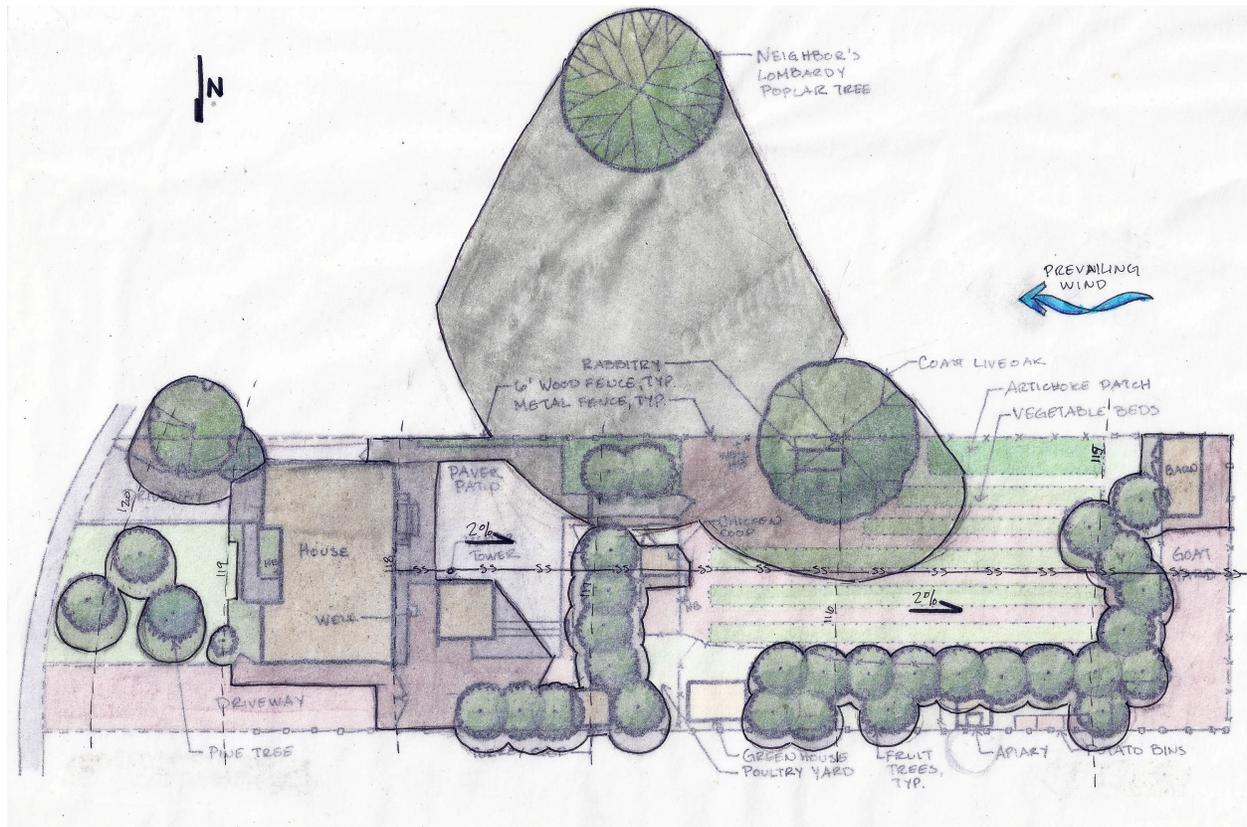




PERMACULTURE DESIGN

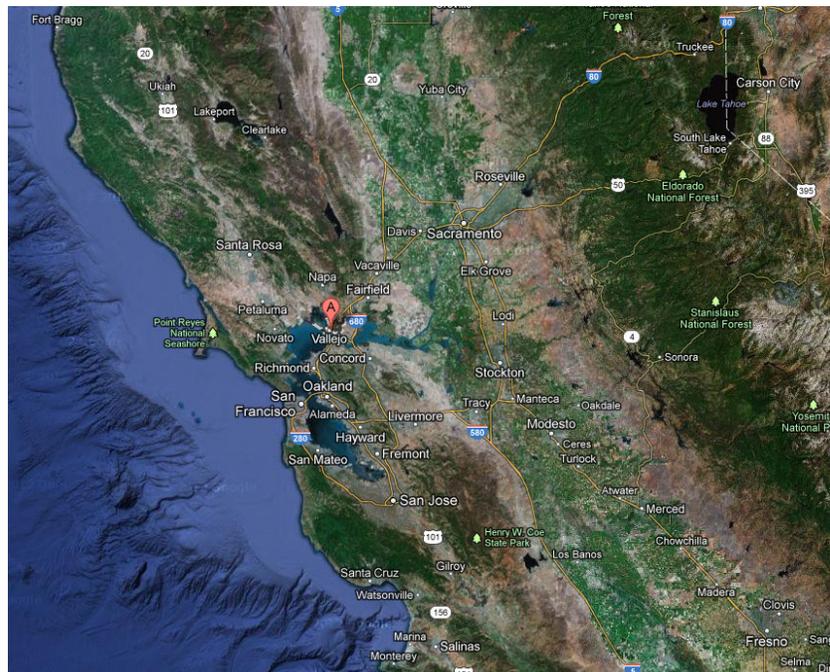


SITE ANALYSIS



LOCATION

Dog Island Farm is located in the city of Vallejo in the northeast San Francisco Bay Area. Vallejo is approximately 30 miles northeast of San Francisco and is surrounded by water on the south and west edges. The southern edge of town is bordered by the Carquinez Strait that connects the San Pablo Bay with the Suisun and Grizzly Bays. The western edge of town is bordered by the San Pablo Bay and the Napa River Delta and adjoining marshlands. The property is .28 acres of relatively flat land with a slight 2-5% slope towards the back of the property. The property is



narrow and long and runs from east to west. The property is approximately 61' wide at the front of the property (eastern end) and 241' at its longest side (north property line). The south property line is 221' long and the west property line is 58' long. The backyard is accessed through a man gate on the southeast side and a vehicular gate on the north east side. There is a lot of pedestrian and vehicular traffic on the street as it's a thoroughfare through town.

SITE HISTORY



The property was developed in 1957. Prior to that it was part of a large fruit orchard. Remnants of old irrigation piping can still be found in the ground while digging. The house directly to the north was the original farmhouse on the property while our property has the original well and water tower that once provided the orchard with water. Prior to being an orchard the site was most likely native grassland, chaparral and oak woodland. The water tower (also called a tank house) was falling apart but because it was considered historical the previous owners were not allowed to take it down. It housed a family of barn owls that the previous owners removed, along with destroying all of the eggs, and refinished the tower into a pseudo-apartment. The previous owners also stored junked cars and trash in the backyard and at one point had planned to put a double wide mobile home on the back of the lot. The well was nonoperational when we moved in but we had it repaired. When we moved here in 2008 the property had several diseased and poorly maintained fruit trees and two large black walnut trees. We removed all except for one citrus tree. The property also had a large, naturalized patch of artichokes that we kept.

CLIMATE

CROCKETT, CALIFORNIA (042177)

Period of Record Monthly Climate Summary

Period of Record : 1/ 1/1918 to 2/28/1977

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	54.1	59.6	63.5	66.8	71.1	77.0	80.0	80.3	78.7	73.3	64.3	54.9	68.6
Average Min. Temperature (F)	40.8	43.6	45.6	47.6	50.9	54.7	55.2	55.5	55.6	52.5	47.1	42.0	49.3
Average Total Precipitation (in.)	3.55	3.10	2.31	1.37	0.38	0.16	0.03	0.04	0.20	1.05	2.08	3.38	17.65
Average Total SnowFall (in.)	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Average Snow Depth (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0

Percent of possible observations for period of record.

Max. Temp.: 76.3% Min. Temp.: 76.3% Precipitation: 99.9% Snowfall: 99.9% Snow Depth: 99.9%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.

Western Regional Climate Center; wrc@dr.edu

Our climate is considered a Mediterranean climate with cool, wet winters and warm, dry summers. USDA Plant Hardiness Zone 9b. Sunset Zone 17. Typical rainfall only occurs between mid-October and late April with an average of 18-20" per year with just 55 days of precipitation and 258 days of sunny weather. The last few years, however, we have seen more erratic weather getting a much higher amount of rain as late as July and August or drought conditions with no rain for most of the winter. First frost date generally occurs in mid to late-November and the last frost date can occur as late as mid April. Freezing temperatures are rare and generally only occur in January. The average low is 39°F in January and the average high is 83°F in July. Vallejo has many microclimates with temperatures ranging as much as 10 degrees at any given time. There are even noticeable temperature differences on our property and in our neighborhood. Frost can occur in our front yard but not in our backyard and vice versa. Prevailing wind comes from the west year round.

SOILS



Our soils have classification DIE – Dibble- Los Osos clay loams. A soil profile shows a nearly even mix of soil types – clay, silt, and sand – resulting in a clay loam. USDA considers our area to be 9-30% slopes, however our site is 2-5% gradually sloping to the west. The parent material of the soil is residuum weathered from sandstone. The soil is relatively shallow with paralithic bedrock 20-

40" deep. They are well drained with no risk of flooding or ponding. Soil can only hold onto 5" of rain. The water table is over 80" deep. USDA land capability classification is 4e. Class 4 means that the soils have very severe limitations that restrict the choice of plants or require very careful management, or both. The subclass e denotes what the limitations are - made up of soils for which the susceptibility to erosion is the dominant problem or hazard affecting their use. Erosion susceptibility and past erosion damage are the major soil factors that affect soils in this subclass. Erosion is more likely to occur on steeper sites and since my site is classified as 9-30% this is most likely why the class is so low. However, our slope is much flatter so the land capability is greater. USGS classification is Lower Cretaceous marine rocks from the Early Cretaceous period. Primary rock type is Mudstone and the Secondary rock type is Sandstone. Being along the "Ring of Fire" we also have many active faults in our area, some are less than 1 mile from our home.

In September 2009 we had a soils test done due to failing plant materials. We had been irrigating with well water and the soil had developed a white crust. The soils test proved our suspicions that we were having a salt problem and have since stopped using well water to irrigate and flushed the soil, which corrected the problem. Other than salt, our soil had high levels of organic matter, nitrogen, phosphorus, potassium, magnesium, sulfur, zinc, manganese, iron, copper and boron. We were deficient in calcium. The pH of the soil was neutral at 7.0.

BIODIVERSITY

Plant species on site include the following:



Annuals: Beans (Pole), Beets, Brassicas, Carrots, Celery, Corn, Cucumbers, Eggplants, Garlic, Kale, Leeks, Lettuce, Melons & Watermelons, Onions, Peas, Peppers, Potatoes, Radish, Squash, Salsify, Swiss Chard, Tomatillos, Tomatoes, Turnips, Mustard



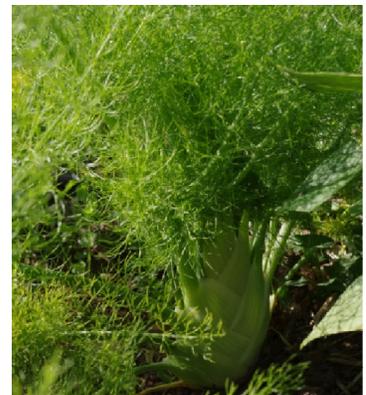
Forage: Alfalfa, Orchard Grass, Tetrelite intermediate ryegrass, Tetraploid perennial ryegrass, Common Flax, Buckwheat, Tetraploid annual ryegrass, Japanese millet, Red clover, Strawberry clover, Ladino clover, Broadleaf Trefoil

Fruit Shrubs & Perennials: Aronia Berry, Heritage Raspberry, Willamette Raspberry, Chandler Strawberry, Sequoia Strawberry, Chandler Blueberry, Bluecrop Blueberry, Southmoon Blueberry, Muscat of Alexandria Grape, Ruby Seedless Grape, Chandler Black Currant, Rosa rugosa, Gooseberry, White Currant, Red Currant, Triple Crown Blackberry, Stevens Cranberry, Evergreen Huckleberry, Pineapple Guava, Prickly Pear, Artichokes, Asparagus, Rhubarb, Hops, Chayote



Fruit & Nut Trees: Blenheim Apricot, Granny Smith Apple, (Johnny Appleseed) Cider Apple, Arkansas Black Apple, Pink Pearl Apple, Arctic Blaze Nectarine, Hosui Asian Pear, Bosc European Pear, Bing Cherry, Black Tartarian Cherry, Giant Fuyu Persimmon, Black Jack Fig, Wonderful Pomegranate, Eureka Lemon, Blood Orange, Clementine, Bearss Lime, Sour Orange, Washington Navel, Lisbon Lemon, Satsuma Mandarin, Meyer Lemon, Rio Red Grapefruit, Cara Cara Orange, Illinois Everbearing Mulberry, Karp's Sweet Quince, Monstruese de Evreinoff Medlar, Indian Free Peach, Jubileum Plum, Garden Prince Almond, Arbequina Olive, Manzanillo Olive, Strawberry Tree (Arbutus)

Herbs: Rosemary, Lemon Grass, Oregano, Marjoram, Tarragon, Summer Savory, Sage, Mint, Chocolate Mint, Lemon Verbena, Yerba Buena, Rosemary, Lemongrass, Thyme, Cilantro, Chives, Grandma Einck's Dill, Lemon Balm, Comfrey, Sweet Woodruff, Italian Parsley, Fennel





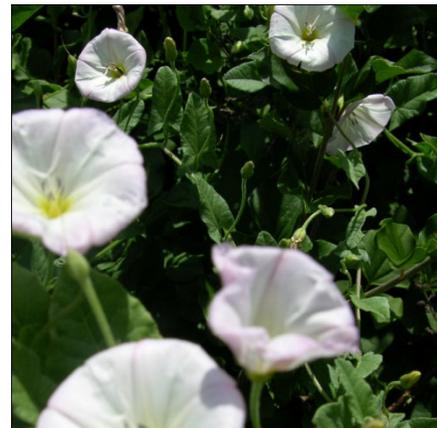
Ornamentals: Narcissus, Daffodil, Iris, Echinacea, Blanket Flower, Yarrow, Wormwood, Leather Leaf Sedge, Dahlea, Daylily, Lavender, Wild Blue Rye, Miscanthus, Penstemon, Rudbeckia, Heuchera, Hydrangea, Agave, Jade Plant, Japanese White Pine, Hybrid Roses, Mexican Feather Grass

Domestic Animals: Dogs, Cats, Chickens, Turkeys, Goats, Rabbits, Honeybees



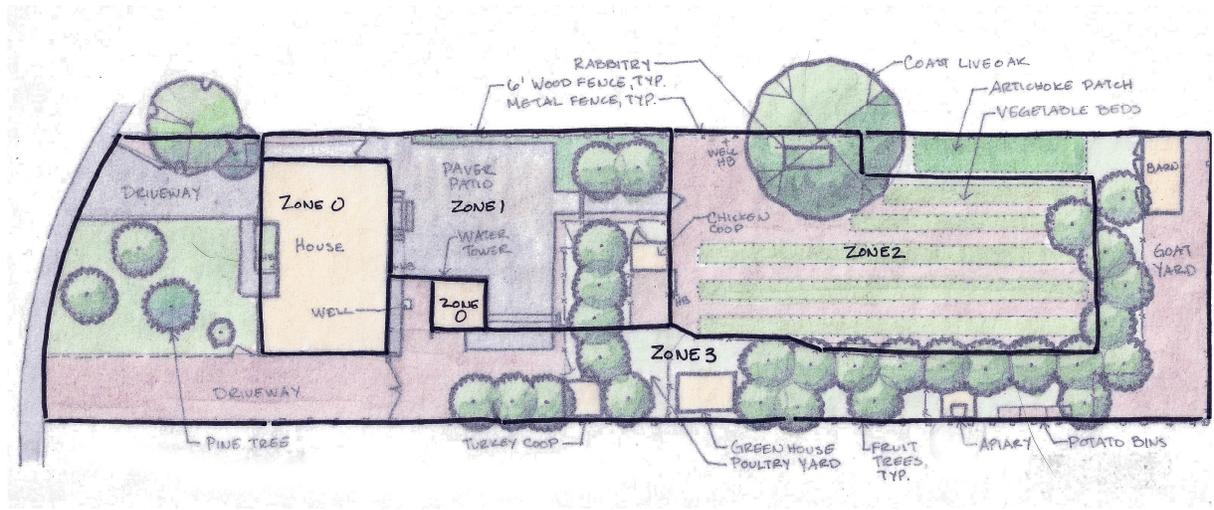
Native Animals: Bumblebees, Sweat Bees, Thread-waisted Wasp, Praying Mantis, Lacewings, Digger Bees, Lady Beetles, Spiders, Soldier Beetles, Ground Beetles, Barn Owls, Red Tail Hawks, Centipede, Crane Fly, Hover Fly, Syrphid Fly, Dragonfly, Raccoons, Opposums, Skunks, Coyotes,

Noxious Weeds and Pests: Codling Moth*, Leafminer*, Spittlebug, Mealybug, Armyworm, Cabbage Butterfly, Cutworm, Rodents, Tree Squirrels*, Fleas, Bermuda Grass*, Field Bindweed*, Dock*, Mallow, Snails*, Slugs*, Earwigs, Pillbugs, Scales, Cucumber Beetles, Ants, Tomato Hornworms, Crabgrass, Burclover, Catchweed Bedstraw, Groundsel, Nightshade, Purslane, Scarlet Pimpernel*, Sowthistle, Himalayan Blackberry*, Dandelion, Oxalis, Plantain, Black Medic, Creeping Spurge, Common Knotweed, Spotted Spurge, Bristly Oxtongue, Sowthistle, Stink Bugs*, Seedcorn Maggots*, Warehouse Beetles, Jerusalem Cricket, Foxtails*, Wild Oat, Ripgut Brome



*Denotes the more severe weeds and pests on this property

SITE ELEMENTS & VISIONING



Zone 0



Zone 0, the high-use built environment includes our 750 sf home along with our water tower. The zone is made up of shelters where most of our time living and sleeping takes place. The water tower is where we currently store our animal feeds, miscellaneous animal equipment and tools. The water tower includes a $\frac{3}{4}$ bathroom upstairs and a small sink downstairs.

Future Plans: Future plans for Zone 0 include adding on and remodeling the house to increase our dining and kitchen

area and bathroom. We would also like to replace our wall furnace with a wood stove to reduce our reliance on fossil fuels, particularly natural gas. The attic needs insulation and we'd also like to install a solar powered attic fan to help reduce cooling and heating costs as well. We would eventually like to go off the grid using solar and/or wind power, but currently we do not use enough energy now to justify the cost of installation of these items. We would also like to install a greywater system, however, greywater is illegal in our community. We can, and do plan, to eventually put in a rain catchment system off of the roofs of the house and water tower. We would also like to replace our conventional tank water heater with a tankless water heater to further reduce our dependence on natural gas. The plans for the water tower include converting the downstairs area into a pantry and food storage area because it stays a consistent cool temperature throughout the year. This would include the installation of shelving units and possibly a way to lower the temperature further if needed.

Zone 1

Zone 1 is an outdoor area that is used regularly and where we spend most of our outdoor time. It includes a large dry-laid paver patio, a makeshift outdoor food preparation area, canopy, outdoor dining area, clothesline, water spigot, ornamental perennial garden, arbor, some fruit trees, chicken coop, primary chicken yard and secondary poultry yard. The primary chicken yard is directly attached to the chicken coop. If we need to keep the chickens fully contained we can leave them in this area and not let them out into the secondary yard. The primary chicken yard is made of wire fencing material and is covered by chayote squash vines. The secondary yard is not fully enclosed like the primary yard and access to this yard is through the chicken coop door. The secondary poultry yard serves as the primary

turkey yard. Zone 1 also includes a man gate to the southern side of the house. The perennial garden's primary goal is to increase biodiversity, habitat for beneficial insects, and forage for both chickens and pollinators. The arbor offers support to a hops vine.



Future Plans: I would like to continue adding perennial plants that are either edible, medicinal, or offer forage for pollinators. This would include adding passionfruit vines along the edge of the chicken yard, additional pots on the patio, including two large 3'-4' galvanized planters each with a fruit tree planted in them. I'd also like to plant pasture seed in the secondary chicken yard. By the gate to the larger garden I want to include another arbor for more vines.

I also want to make a permanent outdoor kitchen including a barbecue and sink and also build a cob oven. I'd also like a trellis structure coming off of the house to offer protection from inclement weather during the winter and offer shade in the summer. On the western side of the water tower would be a storage area for tools.

Zone 2

Zone 2 is our garden area that is high yielding and intensively cultivated. This is our primary vegetable garden and rabbitry. A large variety of perennial and annual plants are grown in this area. The primary goal of this area is to provide as much of our diet as possible. The main water supply is in this area along with our well's spigot. This area is currently on automated drip irrigation. There are 3 beds that are 4' wide and 75' long and two beds that are 4' wide and 40' long. An 8' long portion of the northern bed at the east end is a raised bed for asparagus. Two thirds of the southern bed has been converted into a



short hugelkultur bed on the western end. The two longer, northern most beds are also lined with rock. Along the southern property line is a large, mature Coast Live Oak which offers shade for the rabbitry which houses a breeding pair of American rabbits and a breeding pair of Californian rabbits. Just to the west of the rabbitry are two underutilized rabbit hutches and a long narrow raised bed with nothing growing in it.

Future Plans: First and foremost the goal is to increase yield while decreasing labor and water.

Eventually I'd like to convert all of our beds into hugelkultur beds if we find that the new one we just built works well for us. I'd also like to find a way to eliminate the bindweed, dock and Bermuda grass in the beds and in the walkways. I'd also like to complete the rock borders on the rest of the beds and also utilize the area in front of the rabbit hutch more, which currently is just an open patch of ground. It is in almost full shade all year round, which does present a challenge. I would also like to find a way to grow edible mushrooms in the garden beds alongside the vegetables.

Zone 3

Zone 3 is a less intensively planted area that contains mostly perennials and trees. It includes the front yard and driveways. One driveway is on the southern side of the front yard and has access to the garage. The second driveway is on the northern side of the front yard and has access to the backyard through a vehicular gate. The front yard has three trees, a madrone, a Medlar tree, a Lisbon lemon in poor condition (that we recently "rescued" from someone's front yard), and a Japanese White Pine. The rest of the landscape in the front yard is made up of edible groundcovers (like strawberries) and perennial edibles. Zone 3 in the backyard includes the driveway into the backyard, the rest of the fruit trees not in Zone 1, the turkey coop, part of the secondary chicken yard, the bee hives, greenhouse, potato bins, primary goat yard and barn, secondary goat yard, artichoke massing, and well. It also include a tertiary poultry yard containing part of the orchard that we seed with pasture seed in the fall and allow to grow enough before allowing the chickens and turkeys on it. Outside of this yard is the remainder of the orchard which has been seeded with alfalfa and orchard grass which we hay for the goats. The secondary goat yard is also seeded with alfalfa and orchard and when it grows enough we allow the goats to graze on it occasionally. Around the well, which is located between the house and water tower is nearly full shade and we attempted to create a mushroom garden there. It has three inoculated logs (2 with oyster



mushrooms, 1 with lions mane mushrooms). It also has ferns, columbine and Iron Cross oxalis in this area.

Future Plans: Increasing production of fruit, potatoes, mushrooms, and hay is the primary goal for this area. I'd like to increase the tertiary poultry yard to include the entire orchard but that would reduce the amount of hay we could produce for the goats. I'd also like to successfully seed the goat yard so that they have more forage available than just what is available in the secondary goat yard. I want to finish the greenhouse with corrugated fiberglass for the roof rather than the plastic sheeting it currently has. We also need to build shelves and tables for the greenhouse. In addition we'd like to eventually include aquaculture in the greenhouse to supply our home with fish. I'd also like to increase the amount of forage for the poultry as well. I would also like to inoculate the mushroom garden again with King Stropharia spawn and baby it more.

RESOURCE ASSESSMENT

Time: Our time is limited due to us both working full time jobs. Weekends are our only time to really get work done and many of those are taken up with other plans and events. There are some hours after work during the summer months that we can get work done. Besides working paying jobs we do a lot of day-to-day work such as caring for the animals, milking goats, and making meals from scratch. During the winter months it's basically impossible to get any outdoor work done after we get home because it's too dark outside.

Finances: Right now finances are limited due to several factors so if we can get free or very cheap supplies that works best. Usually we can find what we need for wholesale prices at minimum. Due to my line of work I can get many landscape and gardening supplies and plants at wholesale or for free.

Materials: We hang on to all extra materials. We currently have a excess lumber, metal conduit, PVC pipe, chainlink fabric, chicken/stucco wire, pallets, privacy slats for chainlink fencing, paver bricks, compost, firewood, plastic sheeting, frost blankets, plastic 5-gallon buckets, planter pots, concrete Christy boxes, burlap bags, baling twine, wire, concrete reinforcing fabric, rebar, and weed fabric.