

PERMACULTURE DESIGN COURSE

Final Project

INTRODUCTION

Context:

This Permaculture Design Course Final Project, called “RainShadow Forest Garden” is based on a 484 sq. ft. (45 sq. m.) piece of land that for many years was a rock garden crowded with the cacti and succulents common to the neighborhood because of the area’s sandy soil and Mediterranean climate. A change in my life—the community garden where I volunteered was bulldozed, along with a constant need to feel “at home” in a culture not originally mine—caused me to see the potential of this patch of land.

At a busy intersection one short block from Main Street, Santa Monica (SM), California, RainShadow fronts a church, a 1935 era building whose architecture, three stories if you count the belfry, is more that of a theater hall than a church, albeit with stained glass windows.

A United Methodist Church, the Church in Ocean Park (CIOP) is part of an area called Ocean Park, that is legally designated historic. Modifications to longstanding (1800s) buildings are strictly regulated. The land on which the church stands, together with three adjacent properties, is owned by the United Methodist Church of Santa Monica. With a congregation at a humble two hundred, CIOP is not financially well off. It is, however, rich in the practical support of social justice and community activism.

This pragmatic mission was adopted during the Great Depression when CIOP members took themselves beyond the church walls (initially a home-sized building next to the 1935 build) and out into the neighborhood. They hit the streets, interacted with residents, learning of their needs, and being of hands-on in their service.

While not a church goer, I was drawn to the church by a banner advertising a drop-in choir. I had enjoyed choir singing as a teenager and had the urge to return to it. Going to and from practice, I could not help but notice the entrance garden plot, and how, while self-sustaining with drought-resistant cacti and succulents, it was unkempt, even neglected looking, overgrown as it was with inedible weeds and long grasses.

Given I had recently published an article (<https://www.smdp.com/beyond-the-waitlist/186619>) in the local paper where I encouraged readers to exercise initiative and imagination when looking for a place to grow, I took my own advice and approached the pastor

“Who’s taking care of the garden, Janet?”

“That’s the trouble,” she said in a tone of concern. “No one.”

I understood her concern. The garden is in a public spot at a relatively trafficked intersection along with a lot of foot traffic heading to Main Street. A curving pathway through the garden leads to the front entrance, a path that is open to passersby. The garden as it was then, was reflecting some level of neglect by the church.

Thinking that poor does not have to mean without beauty or care, I volunteered to steward the space. Almost immediately, this stewardship created the stimulus for deeper learning about growing and thus my enrolment in the PDC, a recommendation made to me by my horticulturist and garden writing sister, Shannon, who resides at Foxton Beach, New Zealand. My enrolment in the PDC led to soil studies with Dr. Elaine Ingham's Soil Food Web School.

Both these lines of study moved me toward thinking about the garden space in terms of food for people, wildlife, and for the garden itself. I wanted it to be inclusive, meaning no "Stay off the grass" signs. This welcoming approach has come to include, not without some internal struggle, a few homeless who bed down on the path and the porch on summer nights. So too has the garden developed as a form of edification as I stay open to inquiries from passersby, and make videos for the congregation. It has come to serve a wider community through beautification, edibles, as a composting site, and through the production of thermophilic compost providing extracts and teas for a non-profit that grows container veggies at housing complexes for people of low economic means.

ooOOoo

Self-Analysis:

When I took over the stewarding of the Church in Ocean Park (CIOP) "RainShadow" garden it was to satisfy a need to garden independently, and to prove that I could turn that patch into something other than the cactus and grass patch that it was (neglected, in that no one was caring for it although it was doing a good enough job on its own with very established succulents). Much of the neighborhood grows succulent gardens because the soil, sandy clay loam, does not grow much else without a lot of work and amendment.

When Covid hit the US, my work as a substitute (relief) teacher in the jail system dried up and eventually substitutes were laid off as the whole school system changed. I asked myself, what is I can do, retrain in, that will be of purpose in the world. The environment has always been top of mind. Environment...garden. I combined both interests by beginning this PDC. That lead to further studies with Dr. Elaine Ingham, soil pioneer.

Both these avenues of learning, my background as a credentialed teacher, and the current state of the environment, helped me realize a greater purpose, well beyond simply acquiring a growing space for myself.

Given the community outreach opportunities that have risen because of my studies and what I call my practicum—the RainShadow Garden—along with being awarded a microgrant by the city council, I am now able to articulate a mission:

to demonstrate, through practice and knowledge, care for the soils in my urban area. By valuing soil, I work to impart that caring to others, thereby raising environmental awareness, and tapping into the need of others in my community to care for themselves by contributing to the health and well-being of the natural world.

As affirmed by my newspaper article, my gardening experience (or lack thereof) was certainly not one of my strengths when it came to stewarding RainShadow, the name I gave CIOP's garden after learning the word in my PDC studies. Rather, it was my awareness of nature, my willingness to risk and learn, my sensitivity to the environment—which I attribute to growing up in Aotearoa and outback Australia along with spending five years in the jungles of Papua New Guinea, all before the age of twenty-one—and my personal sense of social justice, reinforced by my tertiary education which I entered at fifty-three years old.

SM has grown from being a sleepy beach side town of holiday cottages to a wealthy, tourist-oriented city where average property values are now in the millions. Delving into the city's history, however, one sees how through two centuries, this "progress" has come at the expense of indigenous populations, peoples of color, and communities of low economic means, who were eliminated through the local government's use of eminent domain. While Santa Monica City prides itself on being "green" and "progressive" when I walk my neighborhood it strikes me how land ownership is culturally standardized to be unproductive and extractive. Nary a compost bin, few fruit bearing trees, and few vegetable gardens. Yard workers, misnamed gardeners, trim water-thirsty lawns, refurbish ornamental mulches, and wave about leaf blowers. Landscape materials go into city-collected green bins to be trucked to a yard two cities away.

In my immediate vicinity it is encouraging to see one garden designated a nature preserve, and one house that uses a grey-water system for garden hydration. Such examples are unusually, if not rare given the trend in current home builds and reconstructions to cover virtually every centimeter of ground with either building or concrete.

Knowledge of the biological value of land, of soil, and the life it provides for our very existence appears dangerously out of mind if not lost.

Some have called my focus on the microscope level of growing an obsession, suggesting a character flaw. I see it as a strength. How else does one satisfy curiosity if not through inquiry? How else does one shake up the status quo, if not through questioning, learning, relearning and experimenting with “new” concepts and practices such as permaculture and soil science?

This focus allows me, albeit in a small way, to contribute to the repair of our depleted global environment.

ooOOoo

End User:

It took a forward-thinking, open-mindset individual such as me to envision the potential of the CIOP garden. Just as the church generates its income (pre-Covid) by renting out space and property for various community activities, and just as Pastor Janet pragmatically supports local social justice groups in their activism, so too could the garden, with a little imagination, planning, and labor, develop the capacity to produce and be of service to the community.

To my mind, the activities I list under “Context” fall seamlessly in line with the CIOP’s mission of practicing social justice, not only for the congregation and immediate neighborhood but for the greater locale of SM.

ooOOoo

BACKGROUND

Someone said, “Permaculture is revolution disguised as gardening.” That is one reason I find it appealing. It has and does tip the status quo on its head.

At its core are three tenants: earth care, people care, fair share. This requires acting locally but with a world view. I understand these statements to mean that I must think thoughtfully and forward about the space I am stewarding. This means considering social, growing, and environmental aspects, from the past, in the now, and going forward, including leaving a beneficial legacy.

Changing an environmental space requires observations over time, understanding the needs of people who interact with that space and consideration of the legacy that space will provide both future generations and the natural environment. My obligation when practicing permaculture is to move away from the idea that Mother Nature is something to be controlled and bent to my will, to a mindset that asks how can I enhance Nature by understanding and employing the methods she has uses to regenerate herself? The three tenants of permaculture require I think beyond a solo, human perspective. A growing space is best viewed through its local and global contribution: what best practices will preserve finite resources, produce a food bounty, and encourage the space to regenerate without human management?

Through intentional thinking, I have decided to nurture RainShadow to being a forest garden. In doing so my vision is, ultimately, to educate to the value of soil. With microbially diversity I hope to succeed in taking this land to the highest level of succession i.e., a “forest,” miniature though it maybe. It follows that according to my mission, I expect to demonstrate the creation of that soil by taking what was suitable for succulents only, to soil that can provide food both for people and the garden, and therefore a garden that can regenerate without human input.

Even as I write these statements, I am aware of a level of impracticability. I am asking much of a small space such that I have already modified the “food forest” concept to a “garden forest.”

I could have chosen to leave the space as a rock garden of succulents and cacti, pulling weeds and grasses and generally cleaning up. I would have conserved a lot of physical energy! Or, I might have chosen to populate the space with drought resistant flowering plants, such as gerberas, or better still, local wildflowers; or I could have grown only container vegetables so that growing could be done in a controlled fashion. I did initially consider making no structural changes to the layout of the land by simply building the soil with layers of organic matter.

My instinct, however, was to challenge myself to creating a fertile, regenerative space capable of growing edibles, pollinators and producing compost while providing an aesthetic of beauty for passersby; and a space that ultimately could regenerate itself given I will not always be here to steward it.

Given the garden's exposure to the public, I saw an opportunity to educate through example, the potential even a small space has of adding value to a neighbourhood and the greater community. I hope to fulfill the tenants of people care, planet care, and fair share, in a small, but demonstrable way.

I began by providing a static compost open to deposits from neighbours who expressed a desire to dispose of their organic waste other than in a trash bin. Not without hesitation, I removed a raised bed I had made to make a workspace for the bi-annual production of a thermophilic compost pile to make extracts and teas. I volunteered to apply these bio nutrients to sixty raised and container vegetable beds installed by a local non-profit at numerous complexes housing people of low economic means.

While the changes I have made since stewarding the garden a season and a half ago have moved the space in the direction of being a forest garden, I have had some recent plant failures. These caused me to pause, and to re-visit the permaculture principles, one of which is to slow down and observe.

By making RainShadow my final project, I discipline myself to map out a considered plan, which I hope will train me to work more in tune with Mother Nature, to create a public respite of dappled shade where food and flowers grow, and which will evolve to care for itself.

ooOOoo

SITE ANALYSIS

History:

In historical literature, the garden's ground is described as "partially sandy" and "marshland." This of course by those who colonized the land, as opposed to a description by indigenous peoples, which I could not find evidence of in my research. "Marshland" I suspect best suited those with commercial interests in the land in the late 1800s.

There is also mention of sand dunes that were removed to artificially widening the beach, allowing for the eventual construction of ubiquitous swaths of parking lots.

Development of the area began in 1891 by one Abbot Kinney, millionaire, and his various partners. He saw the potential for a beach resort area and over a few decades strategically changed the land and seascape of the area.

In 1891 the wetlands/marshlands were destroyed, water piped in, sewage piped out into the ocean (a common occurrence still when the beach front sewage plant inevitably fails). People, cars, trains, horses, the building of Victorian, Colonial Revivalist, and Craftsman-style homes, the development of businesses and streets, plus numerous piers out into the bay all of which eventually burnt down, stripped and impacted the local ecology. Parks were made, as were board walks to help pedestrians navigate the sand and marsh underfoot.

Leasing land for holiday cottages was part of Kinney's early plan to draw populations to the coast. Seven acres that included the now church site, was sold as an ostrich farm (1889-1895) with thirty-four birds. Manure might have been a positive addition to the land, but at the same time, the birds would have contributed to soil compaction. South of the current garden, land was also leased to grow carnations and Canna lilies. I have persistent volunteer Canna lilies growing in one corner of the garden.

1898 saw the building of vacation cottages, an electric train (which ran up Hill Street passed the garden), and entertainment piers being built. This would have meant soil removal and/or soil disturbance.

In 1902 sixty lots were sold in the vicinity of the current church's location at 235 Hill St. In 1923 the Fletcher family donated the land on which the church and its garden stand, so it is fair enough to assume the church has been the only structure impacting the garden.

A 1935 photograph shows the garden patch as bare. If building practices then were like they are today, topsoil would either have been removed or compacted, thereby destroying the microbiome.

Within the last few years, a land management practice proposed by a church committee member suggested paving the garden for ease of maintenance. Fortunately, that suggestion was voted down by those who, while not themselves gardeners, had an appreciation for preserving the small growing space.

As the garden is now in a designated historical area, it, and the church, are unlikely to incur changes, beyond my coaxing the garden into a regenerative landscape.

When I “inherited” the garden, it was crowded with some well-sized cacti and grasses, along with a peach, and a lime tree both of which are about five years old.

Just the other day I discovered a wine cap mushrooms sprouting in a shady nook. I had attempted to grow mushrooms from spawn but failed so I distributed the bedding around the garden as mulch. This sighting of a fruit bodes well as an indicator of a mycelium web in the soil, especially as the mushroom appeared between the two trees growing in the garden.

Climate: Mediterranean
Latitude: 34.01583 degrees N
Longitude: 118.45139 degrees W
Elevation: 174 ft
Topography: a downward contour line runs through the lower part of the garden. The garden sits on a sloping rise that gets steeper in an easterly direction, with the lower slope moving to sea level.
Grade: 2.3
Avg. Rainfall: 14.7 inches annually
Soil texture: sandy clay loam with about 1% organic matter
Soil Structure: holds shape and is malleable when damp
pH: 7

Soil Biology:

A lab report bio-assaying the compost I have been applying to the garden since removing most of the pioneer cacti and grasses, states...

Beneficial bacteria including likely *Bacillus* species observed. Numbers indicate that protozoa are balancing bacteria well and some nutrient cycling is occurring. Extremely low fungal biomass indicates that growth of weeds would be favoured over crops if the soil you add the compost to does not already have beneficial fungi.

Fungi Recommend Range: 101-1,012 micrograms/gram

Sample: 3, low

The Fungal biomass is below the recommended minimum level for your plant’s stage in succession.

Bacteria Recommended Range: 135-1,350 micrograms/gram

Sample: 436. Good. The bacterial biomass is within the recommended range for your plant’s stage in succession.

F:B ratio 6:1 – 9:1

Sample: 0.01. The F:B ratio is low. Increase fungal biomass or reduce bacterial biomass and check predators to assess balance.

Santa Monica Microclimate:

The summers are warm with early morning fog, and the winters are long, cool, occasionally wet, and partly cloudy. Over the course of a year, the temperature typically varies from 49°F to 76°F and is rarely below 43°F or above 84°F (although higher temps during summer are becoming more common place).

RainShadow's Microclimates/Niches areas:

RainShadow is lined on its north and east sides respectively by white painted brick walls which reflect light and heat around those edges. The south and west borders respectively are edged in concrete paving and large rocks (which framed the garden when it was first created). I built an herb spiral using rocks, bricks, and concrete pieces. Antique tin tubs which also retain heat constitute raised beds.

Most of the garden, then, benefits from reflected and/or retained heat. This contributes toward longer growing times as warmth is release beyond sunset. However, this heat retention/reflection also creates the need for watering in the height of summer when summer temperatures, in recent years, have frequently gotten above 100°F. Heavy leaf mulching is used to counter evaporation from the soil.

Wildlife witness so far: squirrels, bees, pigeons, and red-tail hawks (in the vicinity), crows (always scratching in the garden once I leave it!), ladybugs, snails, hummingbird, ants, aphids, cabbage butterfly, the painted lady butterfly.

Something has gnawed a couple of holes in my Geobin (plastic) in its attempt to get at the static compost. No sign of rats or other rodents, although mice have been caught in the church building, especially since it has been shuttered because of Covid.

Edges: while I have labeled the whole garden as a Zone1, I do imagine the “wildflower meadow” that surrounds the church sign as being the “edge” of the “forest” that I am planning with this project.

That edge, partially shaded by the peach tree in summer, is where I have two stumps as seats. The edge is where I sit and sketch, where a friend comes to do the same. It is a place of contemplation, rest, and imagining that brings together the past—growing up with meadows of daffodils—the present, and the future, i.e., this plan coming to fruition.

Socio-political factors:

The definition of sociopolitical is: something that involves both social and political factors. An example of something that is sociopolitical is the issue of environmental conservation, which is influenced by both social attitudes towards "going green" and by political policies (ref: dictionary.com).

CIOP's focus is on local social and restorative justice. Through a political lens this makes the church left leaning or “liberal” which, during the last administration (Trump era), made it vulnerable to criticism and even attack. The latter occurred when a white supremacist group showed up to heckle an off-site meeting of Young People for Racial Justice.

At one time the garden was threatened from within when a committee member lobbied to have the garden concreted over. His proposition was voted down.

The garden path and church porch are sleeping spots for at least four homeless men, and one woman, that I have met over the last year. Some damage occurs to the path edges, item of

use in the garden are stolen occasionally, and vegetables are sometime taken. While I do not want to put up “Keep Out” or “Don’t touch” signs, I am vigilant in visiting the church to remind the homeless to be gone by 7 am as the pre-school with its entrance right next to the garden opens at that time. Also, 7 am is when I begin work on the garden, starting with watering. I have had to remove items left by the sleepers that range from used needles, smoking paraphernalia, used condoms, empty liquor bottles, broken glass, plastic drink bottles, pens, medical masks, discarded food, blankets, clothing, food wrappings.

Previous Land Uses:

The site may have at one time in the 1800s been part of a Canna lily farm, and a goat or chicken farm.

Market Forces: as stated earlier, the CIOP is now in a neighbourhood designated “historic” so changes to the building are restricted. I doubt any such restrictions apply to the garden given that the church committee member was considering concreting it over. The church and land could, I presume, be sold, if the Covid threat and its accompanying economic downturn leave the owners of the property, the United Methodist Church of Santa Monica, in dire straits.

While CIOP’s income streams have been severely curtailed because of Covid, the church along with the adjoining 4 properties appear to have been kept afloat by the mother church, so for now there is no threat of change, such as the sale of CIOP which might hail the repurposing of the lands and buildings, i.e., condo construction!

Best use of on-site resources and sources of fertility:

An opportunity presented itself where, as steward of this garden, I combined the use of the garden and church resources to benefit the community.

I applied for and received a micro grant from the Well-Being Partners of Santa Monica. By being able to pay help, I produced a biologically complete thermophilic compost pile. I then donated the use of that pile to Growing Hope Gardens (GHG), a nascent non-profit contracted to care for 16 raised beds in a series of housing complexes for people of low economic means in Santa Monica.

I am currently running a trial period on 4 of these raised beds using biological methods centered around the thermophilic compost, produced as a result of studying with Dr. Elaine Ingham, founder of the Soil Food Web. I make compost extracts, teas on the trial project, thanks to the generosity the CIOP that allows me access power and space within the church while it is closed because of Covid. The soil in the raised beds was bio-assayed before and will be again after the trial to measure the success of relieving compaction, regenerating growing materials, and producing nutrient dense vegetables. I offer this service free to the GHG but with the expectation that when the trial is successful, biological methods will be adopted for all the raised bed and container gardens. I anticipate being funded with a grant acquired by GHG to carry out these regenerative growing practices.

A further use of resources was making space for a static/cold compost pile. RainShadow has become a drop-off spot for neighbours wanting to recycle their vegetable and uncooked kitchen scraps.

Also, the garden compost is now a weekly drop off spot for vegetable scraps from a Master Gardener who buys for a food bank from a local Farmer's Market. Because of the volume of his contribution, the compost bin has filled rapidly. I have now taken to digging holes at various open spaces within the garden to in-earth compost.

ooOOoo

BASE MAP

See attached drawing.

SECTOR ANALYSIS

See attached drawing.

CONCEPT SKETCH/Imagined Plantings

See attached drawing.

The garden has been through several iterations since I began stewarding almost 2 years ago. Within that time, I have:

- experimented with various path through the garden
- dug swales and berms to capture and retain water
- introduced an herb spiral
- added fabric grow bags
- built a wooden retainer wall
- amassed a corner embankment through layers of composted landscape waste
- assembled and disassembled a lasagna-style raised bed to make a workspace
- tried various composting methods in different locations within the garden
- dug a Hügelskultur-style pit to bury collected rotting logs to increase fungal biomass
- repositioned workspaces around the garden
- had plant failures, namely a Moringa tree and comfrey plant

Because of these efforts, rather than draw concept sketches of other design possibilities, I want here to plan for the establishment of a forest garden. I will stretch myself through researching for plants suitable for growing zone 10 that will create the seven layers of a forest garden.

The following are RainShadow's already established Plants and Trees:



- A **flat peach** (*Prunus persica* var. *platycarpa*) is pruned to maintain height at approx. 8' high. Bears fruit if temps get cold enough, i.e., over 200 hours during the winter. There was no fruit on RainShadow's peach tree last summer even though there were blossom. No fruit set.



- A **lemon-lime** (*Citrus limon* and *Citrus aurantifolia*) is pruned to maintain height at approx. 8' high. It is somewhat espaliered along brick wall and chain link fence. Bares fruit year-round.



- **Silver Tree** (*Leucadendron argenteum*) is an endangered plant species in the family Proteaceae, which is endemic to a small area of the Cape Peninsula, South Africa.

A church neighbour left two containers with a tree each, and a note, “Please water me.” Watering, however, revive the trees that were slowly dying. I figured the roots had outgrown their containers, so I transplanted both in the garden. They have revived slowly, showing some new growth.

The silver tree can reach from between 25-50’; however, I suspect my two will not be that vigorous given their cramped beginnings my garden’s current low F:B biomass. Both trees are now four feet, with a few leaf clusters off their meristems. I anticipate pruning them to shrub height should they show growth spurts. I use these trees as supports for growing peas, beans, and indeterminate tomatoes.



- **Western Sword Fern** (*Polystichum munitum*) was a friend of garden gift; transplanted from a container, it is thriving under the peach tree.



- **Passionfruit vine**, friend of garden gift, is growing along northeast chain link fence. While still a young plant, it produced a couple of fruit at the end of last summer.



- **Lemon Grass** (*Cymbopogon citratus*), gifted by friend of the garden, has established itself toward the front of the garden.



- **Pigeon pea** (*Cajanus cajan*), Congo or Gunga peas, are native to Asia and are grown in many warm and tropical regions throughout the world. This short-lived perennial plant can grow into a small shrubby tree and makes an excellent low hedge or windbreak.

The following are planned additions to create a Forest Garden:



- The **Black Mission fig** (*Franciscana*) is a popular variety of the edible fig. It can grow in virtually any soil type but prefer a sandy-clay loam within a pH range of 6.0 to 8.0 tolerating soils with high lime content. A soil depth of 1 – 1.5 m is sufficient for growth. Once established, trees can tolerate temperatures down to 25° F and potentially lower. This is an easy tree to go in full to part-sun in well-draining soils and very drought tolerant once established.



- **Hummingbird Sage** (*Salvia spathacea*) is a California native sage with a heavenly scent to include in the food forest. It is a low-growing groundcover that is great for competing with unwanted plants (weeds). Highly adaptable and drought tolerant, it can be grown in the shade under your fruit or nut tree canopies to open spaces in the sun. It blooms for much of the year, is highly attractive to hummingbirds. The fragrant leaves can be brewed into a sweet and fruity tea.



- **Mexican Scarlet Sage** (*Salvia gesneriiflora* 'Tequila') has a different growth habit than hummingbird sage. It quickly reaches 10 feet tall and wide, though it can be kept smaller with pruning or trained into a smaller shrub. This sage is also adaptable to sun or shade and is drought tolerant once established. Attracts hummingbirds. The flowers are edible.



- **Ground Cherry** (*Physalis peruviana*) aka 'Goldenberry' aka 'Poha' aka 'Cape Gooseberry' is a shrub, a vine or a groundcover. The highly adaptable plant. Self-seeding.

The fruits look like tiny tomatillos in their papery lantern-like husks and are ripe when they fall to the ground. Inside the husks are bright orange, cherry tomato-sized fruits with a sweet-tart flavor that is great fresh or dried.



- **African Blue Basil** (*Ocimum kilimandscharicum* × *basilicum* 'Dark Opal') is a perennial basil for the coastal California food forest. It likes full sun and is drought tolerant once established. Its leaves are a bit spicier than annual sweet basil. Little purple flowers are edible, great for attracting pollinators.



- **Loquat** (*Eriobotrya japonica*) is a fantastic drought tolerant evergreen fruit tree. Great looking tree! Generally reaching about 15-30' tall and wide, thriving in full sun to part shade, drought tolerant once established and tolerant of many soil types. Delightfully fragrant white

flowers in fall to winter. The flowers may not set fruit if temperatures drop below 28° F, but the tree itself can survive down to 0° F.



- **White leadtree** (*Leucaena leucocephala*) considered for biomass production for its reported yield of foliage. I want to coppice this tree for green manure and for my compost piles. It is efficient in nitrogen fixation, at more than 500 kg/ha/year, and has a fast growth rate: young trees reach a height of more than 20 ft in two to three years. It is considered an invasive species.



- **Pakistan Mulberry** (*Morus hybrid*) is super sweet and juicy and covered in long, dark purple fruits in the summer with a taste reminiscent of raspberry mixed with blackberry jam. delicious. The tree does well in full or part-sun and prefers well-draining soil with regular moisture. It can reach 20-30' tall. Birds love fruit. Winter deciduous and hardy down to 0° F.



- **White Yarrow** (*Achillea millefolium*) is an herbaceous perennial that is native to most of the temperate Northern Hemisphere, including Coastal California. Yarrow grows as a fragrant groundcover and will form a patch a few feet across that is great for suppressing unwanted weeds. It has edible flowers summer thru fall and attracts beneficial insects. The young leaves

are edible and can be cooked like spinach. The above ground portion is used in traditional medicine. Yarrow is also considered to be a 'dynamic accumulator'-its deep taproot helps make nutrients more bioavailable to the plants around it. This ability, combined with its penchant for attracting beneficial insects, makes it an excellent companion plant to include around fruit trees. Yarrow is drought tolerant and adaptable to many conditions, it prefers full sun and well-drained soil. Smells heavenly.



- **Pepino Dulce** (*Solanum muricatum*) is a versatile evergreen groundcover that can be trained as a vine and looks great spilling over a retaining wall or raised garden bed. Spanish for 'sweet cucumber,' the Pepino Dulce tastes like honeydew melon mixed with cucumber when eaten fresh on its own or in salad. Grows in full sun to part-shade. Likes well-draining soil with regular water. Will survive down to 28° F.



- **Comfrey** (*Symphytum spp*) is an herbaceous perennial member of the borage family. While there are over 30 known species, only a few are generally cultivated for human use. cuttings make an excellent bioactivator in the [compost bin](#). If you have a large amount of dried brown material—such as fall leaves—layering it with comfrey cuttings is an efficient way to balance out the carbon-to-nitrogen ratio and jumpstart decomposition.



- **Peanut plant** (*Arachis hypogaea*) Like most other legumes, peanuts harbor symbiotic nitrogen-fixing bacteria in root nodules.^[6] This capacity to fix nitrogen means peanuts require less nitrogen-containing fertilizer and also improve soil fertility.

NOTE: I fear I have on paper at least, overpopulated my little garden space; evenso, this exercise has pushed me to find plants and trees that should flourish in this horticultural zone 10, and that will provide nutrition for both humans and plants. I anticipate there being at least another year of biological treatments before the garden's soil is at a successional stage that can sustain new shrubs and trees. No doubt, within that time changes to this plan will be made. It is satisfying to have made it this far in the design and philosophical process.

References:

<https://earthdesigngardens.com/easy-edibles-for-the-california-central-coast-food-forest-part-1/>
<https://www.anniesannuals.com/plants/view/?id=942>
https://en.wikipedia.org/wiki/Leucaena_leucocephala
<https://www.tenthacrefarm.com/comfrey-uses/>

ooOOoo

DESCRIPTION

This paragraph from earlier in this paper captures, for me, my interpretation of permaculture as designing a system that addresses planet care, people care and fair share:

“By making RainShadow my final project, I discipline myself to map out a considered plan, which I hope will see me work more in tune with Mother Nature, creating a public respite of dappled shade, where food and flowers grow, and which will evolve to care for itself with minimal human input. “

I have designed a system that can reuse not only its own coppiced landscape waste through chop and drop and static/sold composting methods, but a system that also encourages recycling of green waste from the neighbours and community. I made room for a second system, thermophilic composting allowing me to make biologically diverse solids, extracts and teas. These I apply as bio-nutrients to 16 (soon to be 30) container and raised beds cared for Growing Hope Gardens. This non-profit grows vegetables year-round for people of low economic means in subsidized housing complexes.

The vegetables in RainShadow are now grown in antique tubs, the contained soil being easier to hydrate and manage against pest. The surrounding ground is now dedicated to cover crops and to growing perennials, vines, shrubs, and trees that will attract pollinators, including the hummingbird, and for growing fruits and berries.

The trees will provide a canopy of shade against the ever-increasing heat of the summer months and a break from the coastal winds that also seem to be increasing in frequency, turbulence, and duration.

Beyond my small efforts to raise awareness around the value of healthy soils in mitigating climate change, I want the garden to provide a visual and spiritual respite for anyone passing by, by walking the pathway, smelling the sweet peas, or sitting on a stump under the peach tree to simply breathe. Since Covid and all its pressures, I have come to deeply appreciate the aesthetic importance of this piece of ground.

IMPLEMENTATION

At present, RainShadow struggles to grow shrubs and trees. As the soil is bacterially dominated, I am working to build fungal biomass. One method used was a hügelkultur style pit which I filled with rotting stumps I had collected overtime from a state park and which I first used as borders in the garden. I am finding less need for boundaries and borders within the garden of late.

I consistently apply brown leaf and woodchip mulch to the unplanted areas, and regularly spray growth with the bio-nutrients made from the thermophilic compost: extracts and teas together with humates in solution.

Until I reduce the workspace, I cannot plant the mission fig which I anticipate being the second “centerpiece” to the already established peach tree. Now is the opportunity to grow nitrogen accumulators as ground cover, as well as some of the lower tiered plants I researched.

The church at one time had a garden budget from which I could be reimbursed, however, since Covid, revenue streams have dried up for the church. Its doors have been closed for over a year with no plans for reopening anytime soon. Financing the garden then must come from my own pocket, which is at present lined by unemployment payments (dole). Spending, therefore, is negligible. That said, I like using found and given equipment and plants which I find a place for even if they are not “in the plan.” For now, I can concern myself with soil building. I can research local nurseries for the plants I have listed here so as to plan to buy and plant hopefully in autumn (September 2021). In truth, between Covid and unemployment much is unsure. By September, however, I will be trained in microscopy with the Soil Food Web, so there is the prospect of income through bio-assaying local soils at which time I will happily purchase more plants for RainShadow.

Another characteristic of mine is that I am seldom happy with the status quo, so changes in the garden, to the plan, are inevitable. The plan as it stands feels ambitious, perhaps overcrowded, so I anticipate adjustments as I plant, for example, the fig. Beyond keeping the composting systems going and establishing flowering and fruiting perennials I hope to practice flexibility around how the garden develops, given that it is through constant adjustments that the garden has develop thus far.

CONCLUSION

As someone whose practical experience in growing has been little since childhood, I am pleased at my choosing to get involved first with understanding permaculture as a way of approaching growing, and second by expanding my knowledge of the soil and its importance to life, through the Soil Food Web school.

Thank you for offering this course, Richard, and for allowing me the flexibility of working both courses in a time when finances and health have both been severely curtailed and threatened. Stewarding the garden and studying have provided me both a healthful place to be, and a way of forging a new direction into an uncertain future as our planet and societies go through drastic changes.

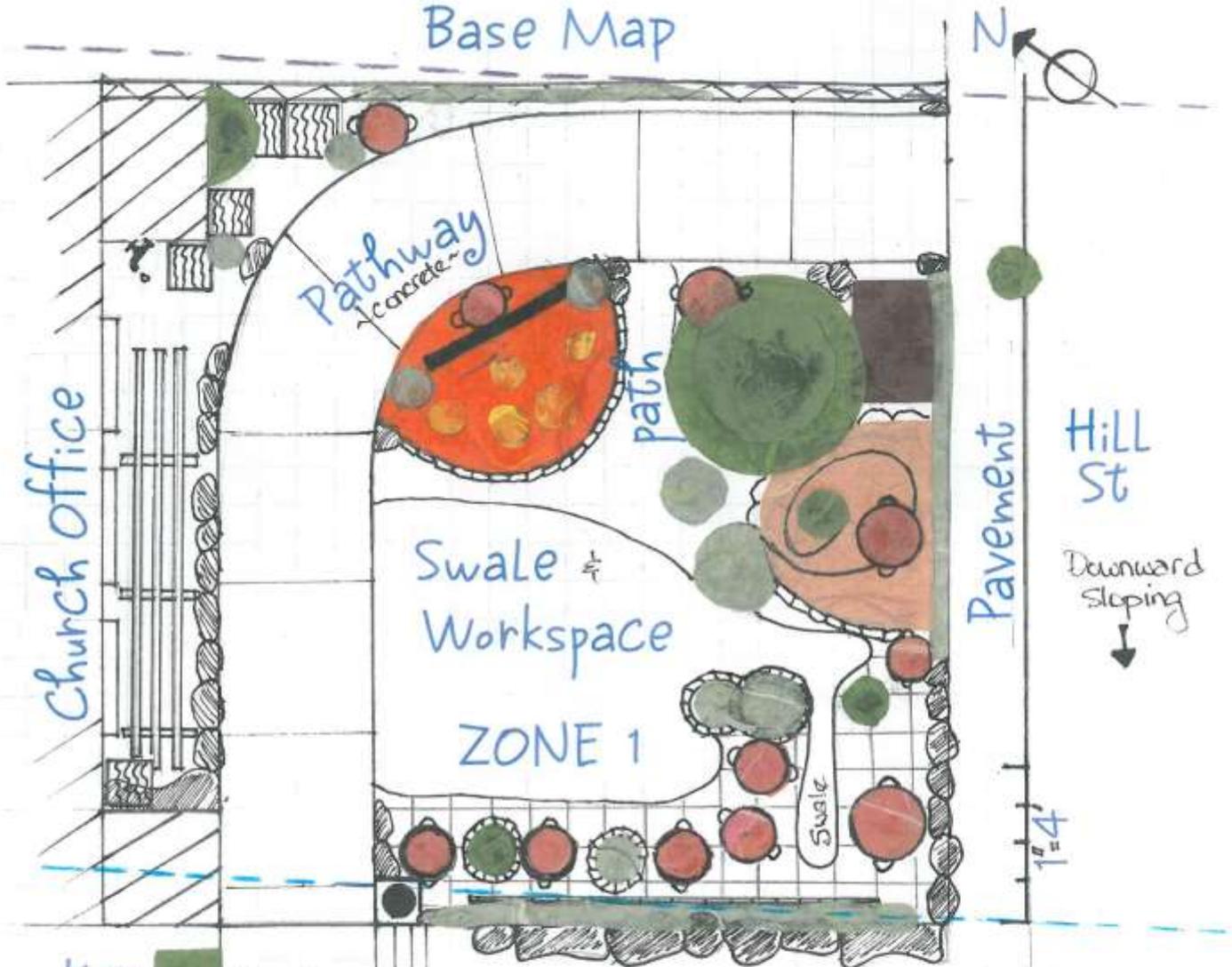
One direction I plan to investigate is taking this Agrifuture's PDC, along with my Soil Food Web qualifications, and looking for work overseas as part of a team on a soil building project. I am looking into EcoRestorationCamps.org, founded by John D. Lui.

To plant a garden is to plant hope. I aspire, in some small way, to provide hope for others, while contributing to the preservation of the natural world that is responsible for life on our planet.

ooOOoo

Base Plan

Rainshadow Forest Garden Base Map



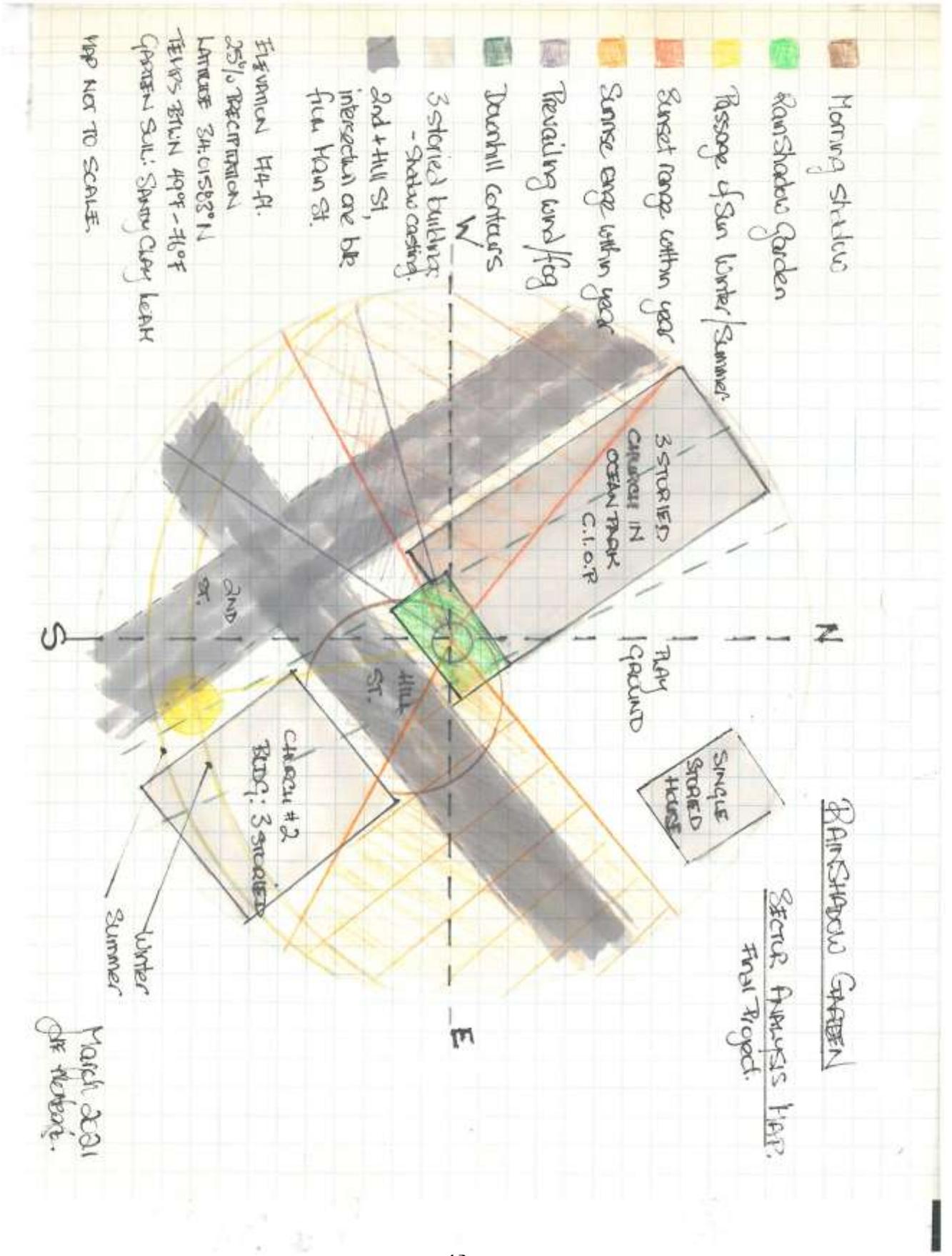
Key

- Trees.
- Perennials & shrubs.
- Compost-static.
- Raised beds-tubs.
- Rockery/spiral.
- Flower bed.
- Faucet & hose.
- Contour & elevation lines.
- Retaining wall - wood.
- Raised embankment.
- Storage/work areas.
- Rocks/retaining wall.
- Wooden rack: workspace for drying.
- Church interior/window.
- chain link fence.

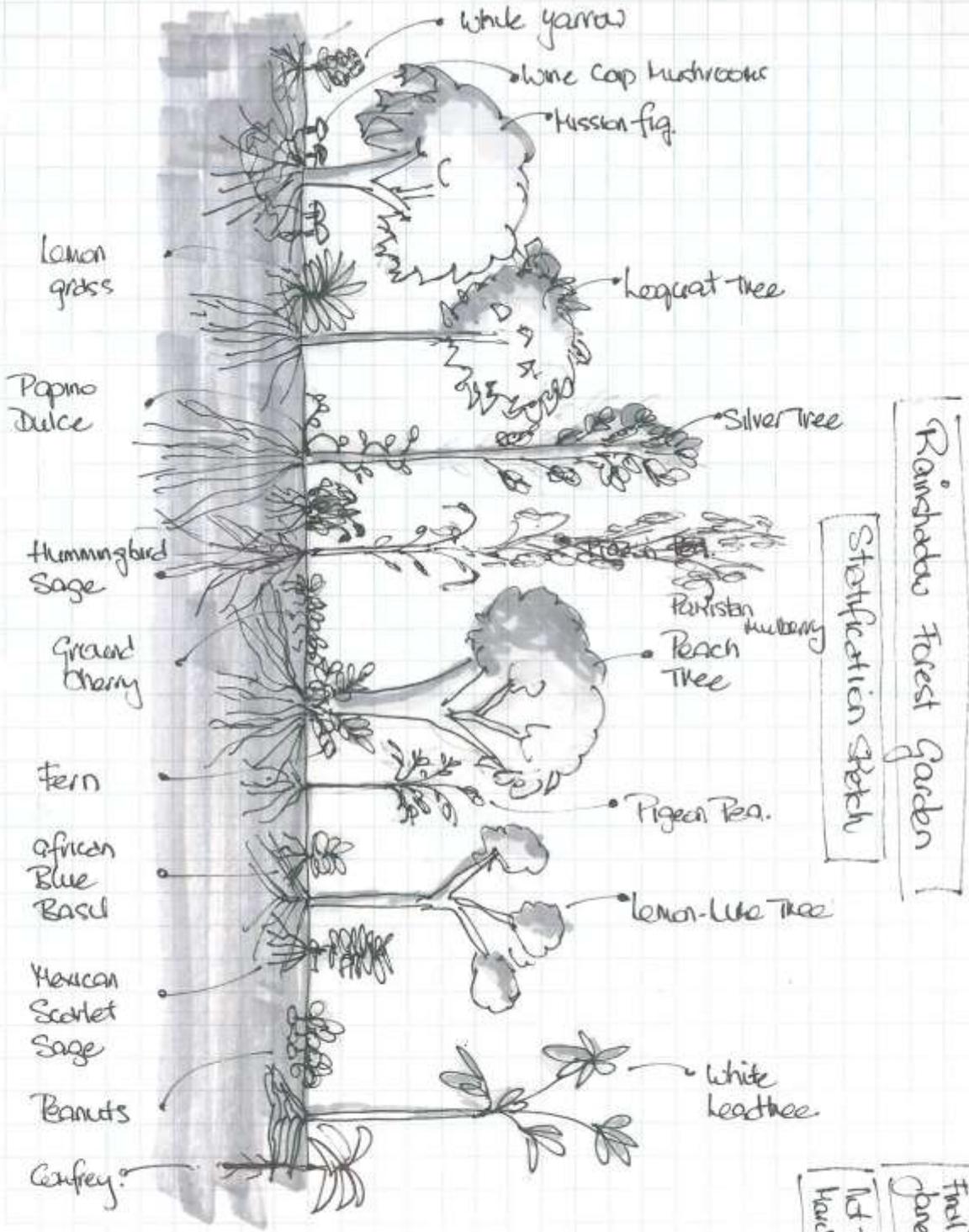
Total Area:
484 sq ft
(45 sq ft)

John Montague

Sector Analysis



Profile



Stratification Sketch

Ramshadu Forest garden

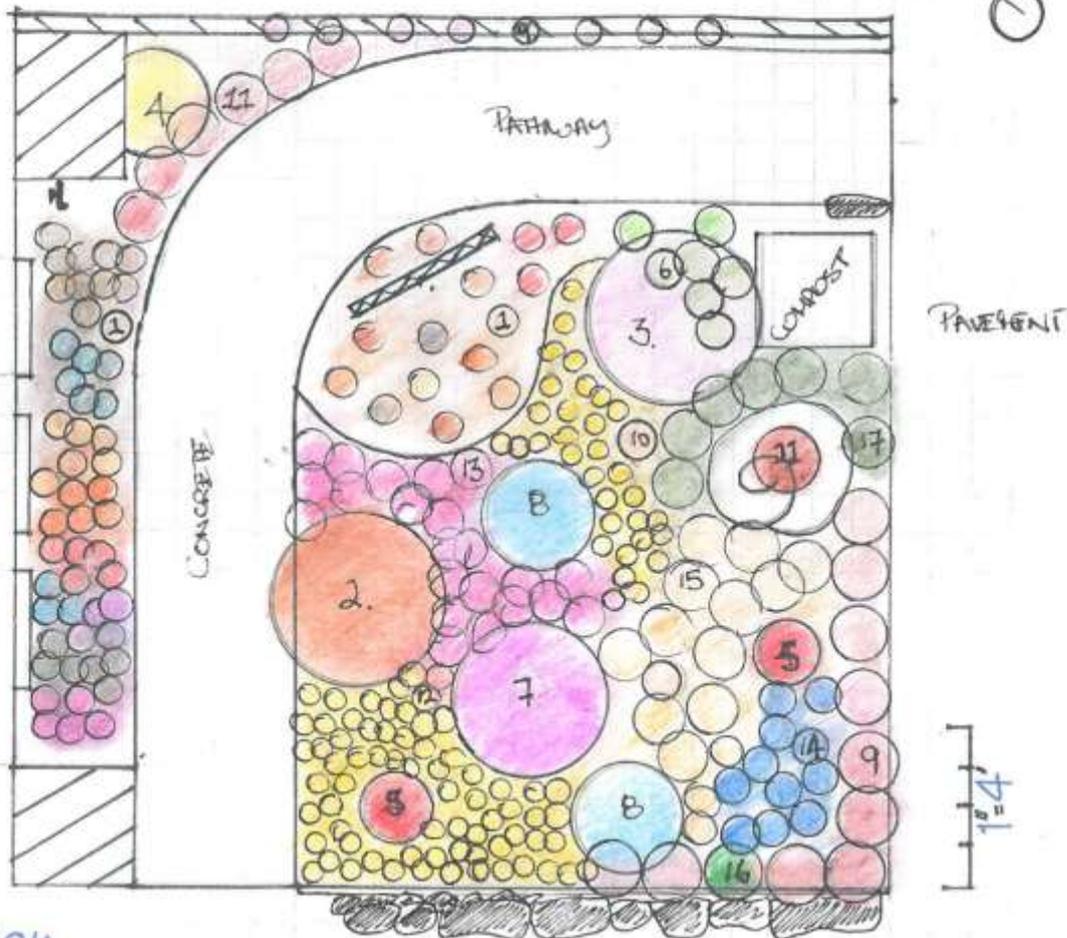
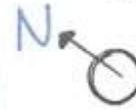
Final Report
Date: / /
Hand: 2021

Final Plan

Rainshadow Forest Garden

Final Plan.

March 2021
Jane Montague



Key

- | | | |
|------------------------------------|------------------------|-----------|
| ① Wildflowers - California natives | ⑨ Papno Dulce | ☐ Rocks. |
| ② Mission fig | ⑩ Pigeon pea | ≡≡≡ Fence |
| ③ Peach tree | ⑪ Mexican Scarlet Sage | |
| ④ Lemon-Lime tree | ⑫ Peanut ground cover. | |
| ⑤ Silver Tree | ⑬ Ground cherry. | |
| ⑥ Ferns | ⑭ Hummingbird Sage | |
| ⑦ Loquat Tree | ⑮ Africa Blue Basil | |
| ⑧ White leatree | ⑯ Lemon Grass | |