Permaculture Design Submission

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Introduction

1.1 Project Vision

My personal vision is a world where people:

- understand that they are part of the natural world; "nature is not a backdrop for humanity."
- work and play in a spirit of co-operation, harmony and mutual support. ۲

The project vision is to create a living and inspiring example of this spirit using permaculture principles in my garden and home (part A) and lifestyle (part B).

1.2 Scope of Project (Issues/areas addressed)

Project Part A

My Home
Reducing use of and conserving water, electricity and gas.
Minimising "waste" leaving the home
Creating a peaceful environment which supports all stakeholders
My Garden
Reducing use of, and conserving, water
Improving the soil without chemical fertilisers
Working with the hot dry summer season
Increasing usable growing capacity /space for food and perfumed flowers/herbs
for personal use and for sharing with others
Providing sheltered, shaded area for art workshops
Providing plenty of sit-spots for contemplation
A safe environment where dogs and neighbouring day care centre are protected
from each other
Creating a peaceful environment which supports all stakeholders
Part B
My Lifestyle

Project

My Lifestyle

Increasing mutually supportive connections with others Minimising use of non-sustainable resources Purchasing locally produced products Using recycled and upcycled goods where possible Reducing use of car/petrol Creating a peaceful environment which supports all stakeholders

1.3 Stakeholders:

Myself

I work from home as a life coach (phone/skype) and teach 15 yoga classes a week (all reasonably local), so I spend a lot of time in my house and garden. I love being outside and my idea of a dayoff is to spend it pottering and working in the garden. I love to be alone or having a one on one conversation with a friend, student or client. I am vegetarian and like to eat fresh local in-season food.

My dogs

I have 2 dogs, both staffy crosses. They tend to bark at loud noises, are good "guard dogs" and do not like it when neighbours are out in their garden making a noise.

My Life Coaching Clients and Yoga Students

Although they may not realise it, I feel that my students and clients are stakeholders in this project as anything which develops my ethics and principles will flow through to my interactions with them

1.4 Why did you choose this topic/project?

This project allows me to learn, experiment, implement, make mistakes and evolve without detriment to others or use of others' resources (cash/time etc.).

It also is the natural project to choose as I was already doing it, regardless of any possible outcome in terms of design certification.

1.5 What is your ultimate goal or intention?

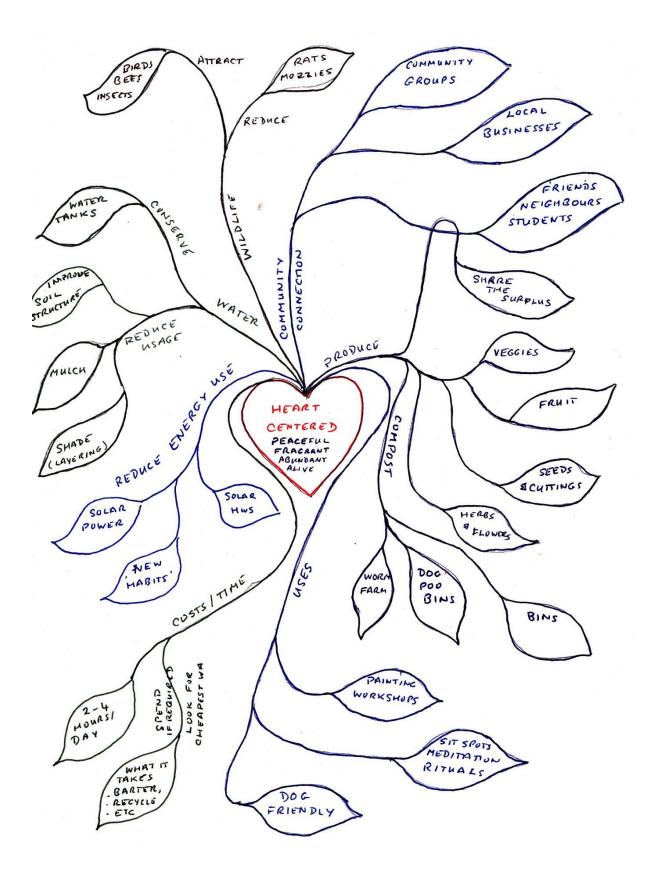
My intention is to learn, experiment and practice permaculture principles and ethics so that they become integrated into my way of being.

I feel that the philosophy of permaculture ties together my current philosophies of Yoga (Yamas and Niyamas) and Earth Based Spirituality and that my roles as a Life Coach and Yoga Instructor will provide the vehicles to spread the word to those I interact with.

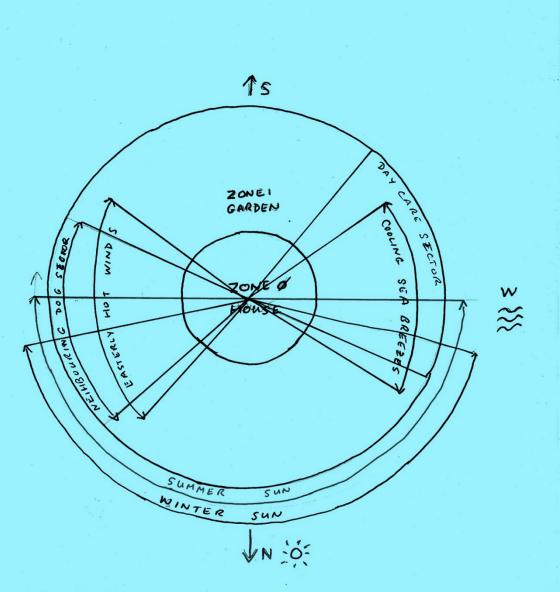
An ongoing intention is to explore how permaculture ethics and principles, along with yogic and earth based philosophies can provide the framework and guidelines for designing global peace. This may take me several lifetimes!!!!

2. Design Overview

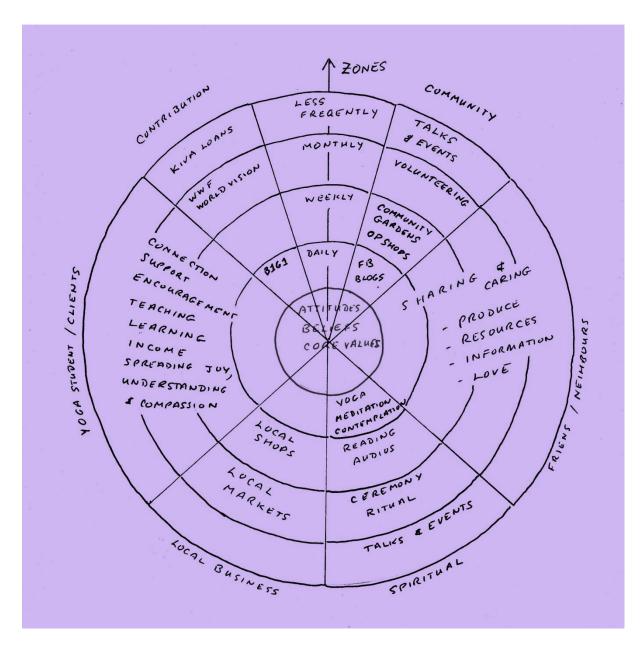
2.1 Stakeholder/User Requirements

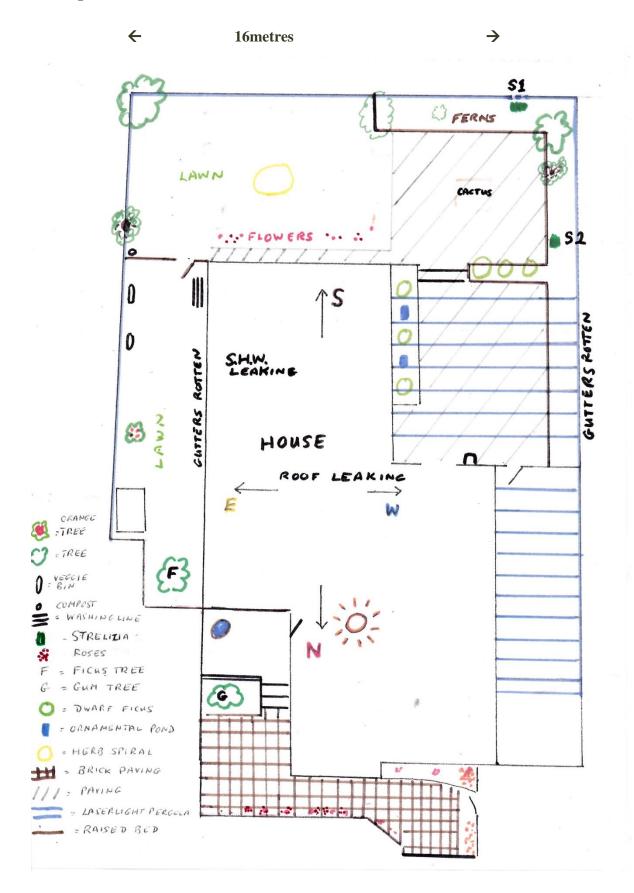






2.3 Zones and Sectors Project Part B







3. Design Details

3.1 Ethics

The following ethics are sourced from http://permacultureprinciples.com/

• Care for the earth

Rebuild natural capital "The Earth is a living, breathing entity. Without ongoing care and nurturing there will be consequences too big to ignore."

This project, like all permaculture endeavours, is fundamentally about nurturing the Earth – being best friends with the Earth.

Zone A0 – re-using greywater, reducing electricity use and reliance on the grid, being mindful about purchases and minimising use of council "rubbish" bins

Zone A1 -Improving the soil – with minerals and clay and mulch; recycling "waste" eg composting, worm warm, dog poo bins.

Zone B0 – Adapting my behaviour to mirror the understanding that there is no "away." I aim to integrate "zero waste" and interconnectedness, deeper into my psyche. I wish to live with the knowing that we are part of nature, that nature is NOT a backdrop for humankind Zone B1 -Including caring for our environment into yoga classes; promoting on Facebook; Zone B2 and B3 – Purchasing from local markets and local shops which sell local produce

• Care for the people

Look after self, kin and community "If people's needs are met in compassionate and simple ways, the environment surrounding them will prosper."

Zone A0 – Providing a nurturing home environment

Zone A1 – Producing food, herbs, flowers

Zone B0 - This ethic is at the basis of my work as a yoga instructor and life coach. Zones B1-B3 Working in community gardens, volunteering with local friends groups

• Share the Surplus

Set limits and redistribute surplus. "We are provided with times of abundance which enables us to share with others."

Zone A1 – sharing seeds, cuttings, seedlings and produce with friends, neighbours, yoga students

Zone B1,3,4 – contributing a percentage of income from every daily business transaction to <u>www.b1g1.com</u>; contributing monthly to World Vision and World Wildlife Fund; making microloans to <u>www.kiva.org</u> whenever I have any unexpected extra income.

3.2 Principles

The following principles are sourced from "Gaia's Garden" Toby Hemenway

Core principles for ecological design

• Observe. "Use protracted and thoughtful observation rather than prolonged and thoughtless action. Observe the site and its elements in all seasons. Design for specific sites, clients and cultures"



with appropriate action or inaction. Spending time engaging with nature and fully articulating user requirements is fundamental to this design. Zone A1 -The design project began with spending time "just being" in the garden, and this practice continues throughout the whole process, listening and watching for feedback and responding



Zone B0 - Observing, listening and sensing the

energy and activity of a person, group or place are also fundamental to Life Coaching, Earth based spirituality, yogic practices and teaching yoga classes and have become part of who I am in the world.

Zone B1 - My daily practices include meditation and journaling and attempting to stay present and mindful.

• Connect. "Place the elements of your design in ways that create useful relationships and time saving connections between all parts. The number of connections among the elements creates a healthy diverse ecosystem, not the number of elements"



Zone A1 - Although I have designated the whole of the garden as Zone 1, areas which require daily attention, e.g. worm farms, sowing and potting area, are placed outside the back door under cover from the rain. The rain water tank and the compost tea making area are also under cover, a few steps from the back door to make watering easy.

The nursery area for seedlings is a few steps from the back door, under the shade of ficus trees, where the new plants can take advantage of any rain and can begin to harden up before going into the hot sun.



Perfumed flowers and herbs, intermingled with vegetables, are growing at the entrance to the house and by open windows



Companion planting is a key feature of the

implementation/design, e.g. planting marjoram around the base of the passionfruit, pyrethrum, borage and lettuce with the strawberries.



Considered placement of herbs for attracting or repelling insects and planting wormwood and pyrethrum where there are breezes.

The fishpond is under the shade and protection of a large hibiscus, the frog pond is positioned under a down pipe from the roof, where it can collect rainwater



The washing line is partially under the eaves, with morning sun and breeze.

Tall flowers, underplanted with vegetables provide perfumed and serene views from the bedroom windows





Zone B0 - In some ways permaculture itself as an art/science provides a framework to integrate coaching, yoga and earth based spirituality whereby lessons and wisdom from each area can be integrated to make best full use of skills and information to support all the aspects of my roles. Recognising the interconnectedness of everything and the importance of developing mutually supportive relationships is perhaps a key to developing more peace in our world.

• Catch and store energy and materials "Identify, collect, and hold useful flows. Every cycle is an opportunity for yield, every gradient can produce energy."

Zone A0 and A1 There are many months with little or no rain. Scheme water and bore water restrictions are in force during the summer months. When it does rain, the rains are usually heavy. The design includes collection and storage of rain water and re-use of grey water. The strength of the sun and the hours of sunshine make solar energy an obvious choice. A solar hot water system and solar panels to produce electricity to supplement the grid are included in the design.

Zone B0 : Keeping a gratitude journal which I can read when I am feeling down. Regularly depositing money into savings and being happy to use it when required. Being alert to kerb pick-ups allows the opportunity to collect useful materials.

• Each element performs multiple functions. *Choose and place each element in a design to perform as many functions as possible.*



Zone A1-Jasmine to be trained over the pergola to provide shade, beauty and perfume

Training vines under the laserlight roof to provide shade.



Honeysuckle and roses are growing up the fences to provide beauty and privacy from "party" neighbours



A lime tree is planted where it will provide shade for the herb spiral as well as fruit.

The peppermint tree provides shade over a "sit spot," as well as privacy from the neighbours. It is also very popular with black cockatoos, which are an endangered species.



The design includes "layering" whereby root crops and low lying herbs and vegetables are protected from the hot sun and from predators by taller plants such as cape gooseberries, roses, salvias and borage.



Existing "structures" such as pergola, orange tree, bougainvillea are used to support grape vine, cucumbers and pumpkins

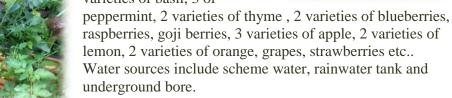


Each function is supported by multiple elements. "Use multiple methods to achieve important functions and to create synergies. Redundancy protects when one or more elements fail"

Zone A1- The design includes vegetables, herbs fruit and flowers growing in many different areas of the garden, in different combinations and conditions. There are many different foods growing, eg lettuce, mizuna, spinach, silverbeet, mustard greens ,beetroot, carrots, broccoli, tomatoes, capsicum, kohlrabi, different varieties of peas

and beans, peanuts, 3 varieties of basil, 3 of





Water sources include scheme water, rainwater tank and There are 3 compost bins, 3 worm farms, and many sit-spots

to suit different seasons and times of day.

Zone B1-B4 I have several different sources of income, many different networks of different communities, and many different sources of information.

Make the least change for the greatest effect

Zone A1 – an example is sprinkling "Soil to Sand" minerals everywhere. Another is putting wire support on all fences.

Zone B0 – Keeping a gratitude diary; spending time just observing.

Use small scale intensive systems, start at your doorstep with the smallest systems that will do the job and builds on your successes. Grow by "chunking" - developing a small system or arrangement that works well - and repeat it with variations

Zone A1- This is the approach I have used throughout the design/implementation. High level design, followed by implementation of a small scale system, get some feedback and



make decisions from there.

I experimented with dog poo composting using old yogurt pots and worms from the worm farm, assessed the benefits and then made the decision to install a larger poo-bin

The plan includes installing one water tank, monitoring to see the rate of filling/usage and then make a decision on whether to install a second one.

Zone B1 – For Yoga and Life coaching I developed one workshop and one on-line course. I then developed further workshops and courses as variations on the original design

• Optimise edge. The intersection of two environments is the most diverse place in a system and is where energy and materials accumulate or are translated. Increase or decrease edge as appropriate



Wire support is included on most of the fences to make use of the vertical edges

Existing rectangular borders are extended to larger, curved borders Rebuilding existing herb spiral to create more edges



Zone B1 - "Pushing the boundaries" to make create more overlap of life coaching and yoga

• Collaborate with succession. Living systems usually advance from immaturity to maturity, and if we accept this trend and align our designs with it, instead of fighting it we save work and energy. Mature ecosystems are more diverse and productive than young ones

Zone A1 On considering this principle it first seemed so obvious that I could not see examples of how I had specifically included it in the design. However, I now realise that I have a problem accepting that death needs to precede re-birth. I find it emotionally difficult to harvest and cut annuals down! It takes patience to plant a tree eg for shade, and wait the years required for it to perform this function. I have learnt to fill the gaps with annuals until the perennial reaches maturity.

Zone B – This is certainly true with my business, Present Perfect, which began with one on one coaching and has blossomed to include many different formats of coaching and yoga.

• Use biological and renewable resources & services By valuing and making use of all the resources that are available to us, nothing goes to waste.

A guiding principle throughout this design is to minimise purchase of non-renewable resources.

Zone A0 and A1 - solar hot water, solar energy, rainwater catchment, grey water recycling are included in the design as noted above. The design includes 3 worm farms, dog poo composting bins and 3 compost bins. All kitchen scraps, any cardboard packaging, paper, the contents of the vacuum cleaner all go into the compost. I have developed relationships with the local supermarket and the local café, and they provide me with vegetable and fruit scraps and coffee grounds for the compost.

Zone B1- Choosing as much as possible not to purchase products with non-recyclable packaging.



Looking out for resources which others have put into skips and are destined for land-fill and making use of them to avoid purchasing. Using "fake-grass" found in a skip to cover a hot dry "problem" area alongside the driveway, finding gnomes on a verge pick-up.





Buying from and giving away to charity shops, rather than putting in the bin. Living by the motto, there IS no mythical place called "Away."

Creating art from what others might consider waste.



Principles based on attitudes

• Turn problems into solutions Constraints can inspire creative design, and most problems usually carry not just the seeds of their own solution within them but also the inspiration for simultaneously solving other problems.



There was a pomegranate tree growing very close to the shed. By moving it a few feet it will now be able to grow without damaging the shed, and will also provide shade for the vegetables in the midday sun.

I could have replaced the damaged gutters, however, it seemed more beneficial to just remove the damaged parts and allow the rain to fall from the roof into the garden beds. This seems to be working well. If I decide to install another rain water tank I will re-assess.

• Obtain a yield "Design for both medium and long term solutions from your efforts "You can't work on an empty stomach"



Zone A0 and A1-Surprisingly, I am finding that I forget to harvest and have allowed too many annuals to go to seed.



This is an area which I need to address as implementation progresses.

Zone B0 - I gain immense fulfilment from my work and lifestyle. My bank balance seems to remain healthy and I have investments for the longer term.

• The biggest limit to abundance is creativity – the designer's imagination and skill usually limit productivity and diversity before any physical limits are reached

I continue to engage with other permaculture practitioners, both on-line and in person. I love to experiment and learn new skills and can visualise many additional options for the future.

• Mistakes are tools for learning. Evaluate your trials. Making mistakes is a sign you're trying to do things better. There is usually little penalty for mistakes if you learn from them

Zone B0 – this principle is firmly fixed into my psyche and is one which I emphasise with my students and clients.

Zone A1 – throughout the design and implementation I continue to trial, evaluate and modify as the project progresses. Along the east side I have removed areas of "lawn" and planted vegetables. Where I have had success I have extended borders several times, including soil improvements BEFORE planting !

3.3 Design Process

3.3.1 Systems Analysis

The first step was to get clear on user requirements How is the site used? Who uses it? What are the outcomes desired. (See 2.1 User Requirements).

Then I looked at budgets in terms of cash and time/resources available to implement. My budget was "what it takes" (within \$15,000) to carry out urgent repairs and reduce use of scheme water and power from the grid. Thereafter, minimal costs, (up to \$200 a month) using my own labour, (around 2 to 4 hours per day), using recycled and scavenged materials, plants and seeds shared with neighbours and friends etc..

Timeframes were " as soon as possible" for urgent repairs and, thereafter, working at a steady pace whenever I had the time, working with nature, with the seasons, implementing what felt right when it felt right. Some things were going to take time to come to fruition, and needed to be started immediately eg soil improvement, experimenting. For the remainder of my requirements, the guidance for timeframes/implementation phases was to work first on those aspects which would bring the most benefit for the least effort (cost/resources (time, skills, materials.)

3.3.2 Site Analysis

3.3.2.1 Existing structures and layout

"What is already working well?"

The patio area outside the back door works well in autumn, winter and spring. The more formal paved area and raised beds work well in terms of providing space for sitting under the shade of the established trees and space for spiritual practices.

The herb spiral has been productive and the two vegetable bins are working well. Around the front gate are mature bougainvilleas which look glorious and provide privacy. The existing roses are also bringing pleasure "What are the problems and how can they be addressed as opportunities?"

The "lawn" area provides potential for more growing space. The lawn is just scrubby dry couch grass in the summer and weeds in the winter.

The east side of the house has similar "lawn" which provides potential for more growing space.

The patio gets very hot under the laserlight roof in the summer.

The roof leaks along a gully where the house was extended many years ago. Buckets are needed in 3 areas and the ceilings are badly damaged

The gutters are rotting in several areas, probably caused by age and also ill-placed trees which have grown to overhang the gutters.

The solar hot water system has begun to leak, wasting water and electricity and compounding the leaky roof problem

An underground bore is in place, but the reticulation system is inefficient with overhead sprinklers rather than drip system. The summers are dry and water restrictions are in place. The fence along the south and west borders is in poor condition, compounded by overgrown strelitzias.

3.3.2.2 Soil Condition

pH balance is not too bad	
South Back border	6
Herb Spiral	6.5
Compost (home made)	6.5
Veggie Bin	7.5
East back border	8
Rose Border outside bedroom window	6.5

The soil structure is generally very sandy with little ability to hold water or nutrients . Under the trees, where there is plenty of leaf fall and shade the condition of the soil is noticeably more friable.

3.3.2.3 Sun/temperatures

"During summer 2013-14, the number of hot days with maximum temperatures of 35 °C or higher totalled 15. The hottest day was 44.5 °C.with a mean of 32°C Mean daily sunshine was 12.2 hours" Bureau of Meteorology

"During Winter 2014 The hottest day recorded was 27°C , with a mean of 20.1 °C and the coldest night was 4.8°C with a mean of 10.7°C. The mean daily sunshine was 6.8 hours" Bureau of Meteorology

3.3.2.4 Wind

In the summer we are sometimes blessed with a sea-breeze from the West, known locally as the Fremantle Doctor, as it soothes us in the hot summer days. Other days we get a hot easterly wind blowing from the desert.

In the winter we are starting to experience more storms with strong winds from the North West. In July of this year (2014) the fence on the west border, which had been weakened by an ill-place strelitzia, blew down.

I was surprised to find there is a breeze flowing North to South along the east side of the house, a microclimate. Here there is morning sun and a gentle breeze, ideal for the washing line

3.3.2.5 Rainfall pattern

"Perth Metro recorded 782.4 mm in 2013 on 114 rain days,. The total for the August and September period was 311.6 mm, the wettest August and September for 58 years The driest month of 2013 was February with 0.8 mm, though November only fell one day short of having its second rainless month since records began in 1876. Arguably of greater significance in terms of lack of rainfall, Perth Metro recorded only 44.0 mm in June, its second lowest June rainfall in 137 years of recording..." Bureau of Meteorology

3.3.2.6 Zones and Sectors

3.3.2.6.1 Project Part A

(See diagram 2.2 above)

Zone 0 - I have designated the house as Zone 0

Zone 1- The whole plot is approx. 16 metres by 30 metres, so the garden is small and I spend time in every part every day. I have, therefore, designated the whole garden as Zone 1.

The sectors I identified are:

Summer and Winter Sun sectors ; Deciduous trees provide some protection from the summer sun and allow sun through in the winter.

Westerly Sea breeze sector: there is a gap under the laserlight roof which allows air movement

Hot easterly wind from the desert sector: this wind is fairly rare and neighbouring trees provide some protection.

Boundary sector : due to the way the plots have been subdivided, there are 5 properties adjoining the site two with dogs, one with "party" neighbours, one with small children and one with a day care, so all boundaries need to be kept secure.

3.3.2.6.2 Project Part B

(See diagram 2.3 above)

I have identified Zones by how frequently I interact with each sector: Zone 0 is attitudes, belief systems, and core values; Zone 1 is daily; Zone 2 weekly; Zone 3 monthly and Zone 4 less than monthly

The sectors include: Contribution Community Friends/Neighbours Yoga students and life coaching clients Local Businesses Spiritual

This design reflects my current lifestyle so implementation, as such, is not needed. However, through contemplating my lifestyle in terms of Zones and Sectors this diagram is helpful to remind me of the importance of maintaining focus and energy on these aspects of my life.

3.4 Implementation

Because this is my first design and I am likely to make mistakes along the way it seemed that it was best to make a high level design, and then do the detailed design and implementation in parallel. A small step or two, sit back, see what worked, make changes, then move on. This seems to be how nature works, constantly receiving feedback and adapting in response.

Phase 1 (Nov 2013 – Feb 2014) – Observing, Learning, low cost experimenting; improving soil – nursing the garden through the hot dry summer

Spend 20 mins or so every day sitting in the garden observing the birdlife, the insects, the breezes, the passage of the sun, the sounds and energies

LEARN - visit community gardens ; attend permaculture groups ; read books, blogs; find sources of veggie scraps (Local Veggie shop) and coffee grounds (local coffee shop) for compost ; stay open and alert for connections, communities; resources. Continue with involvement on committee of Friends group – rehabilitating local swampland.

Put up wire support on all the walls and sow beans and peas along the fences to see what works and provide nutrients for the soil. Plant comfrey, borage and yarrow, to provide nutrients for the soil and for the compost and sow mustard greens and radish as ground cover to reduce evaporation and provide shade to protect existing plants .

Apply home-made compost teas and natural fertilisers as recommended by local permaculture groups specifically for Perth's sandy soils ie "Sand to Soil" minerals, Molasses plus Eco-weed, Apply Lupin mulch to all bare soil;

Put up temporary shade cloth on back patio and garage to reduce heat/sun – plant a second jasmine with aim to train this over pergola

Re-make herb spiral (make it taller); increase size and edges of existing borders by making curved edges

Rig up support to train grape vine to provide shade for veggie bed.

Create a fishpond and a frog pond. I used children's paddling pools found on a verge pick up.

Phase 2 March 2014 – May 2014.

Create 2 more borders along the side of the house (morning sun, afternoon shade) Experiment with:

companion planting; growing from seed ; layering, using taller plants (eg roses, Borage,

Radishes, nasturtiums) to provide protection and shade for low growing plants (eg lettuces, herbs, salad greens etc..).

Plant a blood orange tree for shade and fruit, Plant Lime tree to provide fruit and morning shade for herb spiral

Plant Dwarf Lemon, Dwarf Apples and blackcurrants in pots for now, until I build suitable soil for final planting spots

Begin fruit border –, Goji berries, raspberries, pineapple guava, cape gooseberries.

Move pomegranate tree to more suitable position where it will provide shade for veggies and have room to grow

Found 2 more worm farms (on the verge pickup) and given a 4th raised veggie bin

Experiment with composting dog-poo using large yoghurt pots, base removed, and composting worms

Get quotes for replacing leaking solar hot water system, repairing leaking roof and installing a water tank

Get quotes to remove strelitzia x2 which were taking over the garden and causing the fence to crack and to remove a huge Ficus growing in unsuitable position and a Gum tree which is in danger of falling on the roof Get quotes to replace/repair cracked fences Roof Repair (\$1,375)

Phase 2 June 2014-August 2014

Cut down Strelitzias, Gum tree and ficus, and prune other trees to provide privacy and shade (\$3,800)

Use strelitzias to fill base of 4th raised veggie bin

Replace Solar Hot water system (\$4,200)

Fence Repair (\$800, partially paid for by insurance as it blew down in the last storm)

Install water tank 4000 litre (\$1,875) plan to monitor and see if additional tank is warranted.

Install overflow drain (\$40 materials, my own labour), Used bricks removed to create a raised bed in centre of patio which will grow strawberries, pyrethrum and borage

Remove damaged guttering to allow rain to fall directly onto border (no cost- my own labout) Install large Dog Poo bin following success of experiment in Phase 1 (cost \$120, friends provided most of the composting worms).

Gradually replace reticulation sprinklers with drip system, using reticulation pipe found in a skip on a local building site

Continue harvesting, sowing seeds, monitoring what is working what is not

Phase 4 Sept 2014 –

Start submission for certificate

Prepare for the long hot dry summer :

Re-erect shade cloths and feed Jasmines, to hopefully grow over pergola before summer 2015

Feed the soil with home made compost, and home made liquid teas

Order HUGE bag of lupin mulch to share with neighbours

Begin plans for abundance in existing north and west raised beds

Replace removed ficus with a lemon tree, which will grow without much help from me. This will provide some shade and privacy for the neighbours.

Plant another star jasmine to cover more of the laser-light roof over the patio, as the first one seems to be doing well

Get quotes for solar power and grey water system

Experiment with more perennials

Extend borders further

Monitor water usage from rainwater tank, with a view to installing a second one on the other side of the house.



2013

August 2014



October 2014

3.5 Project Experience

Costs are within budget.

The garden is producing ample produce, including vegetables, flowers, herbs, seeds and cuttings. The soil structure is improving.

There are plenty of frogs around and mosquitos have become less of a problem

I am noticing more birds and bees in the garden, one bird has even built a nest under the back patio.

The roof no longer leaks and the gutters are no longer clogging up with leaves.

Water and electricity bills have reduced,

I have developed good networks and connections

I am introducing permaculture principles into my yoga class sankalpas (intentions)

My enthusiasm is increasing as the project progresses

So far there is nothing that I would consider a failure. I am sure that there will be and this is all part of the process.

I have learned that I need to remember to harvest and not let everything go to seed. I am looking forward to planting more perennials.

Although I took steps to improve the soil structure before planting, I needed to spend more time on this to get full benefits.

So far, I have not felt the need to change any design elements, just allowed them to evolve and grow.

I remain open to continuing to learn and change and let the situation evolve as nature feeds back to me what is and isn't working.

3.6 Next Steps

I plan to continue evolving and learning and integrating what I learn into the garden and into my Life Coaching and Yoga businesses. I wish to inspire and encourage others to adopt permaculture principles.