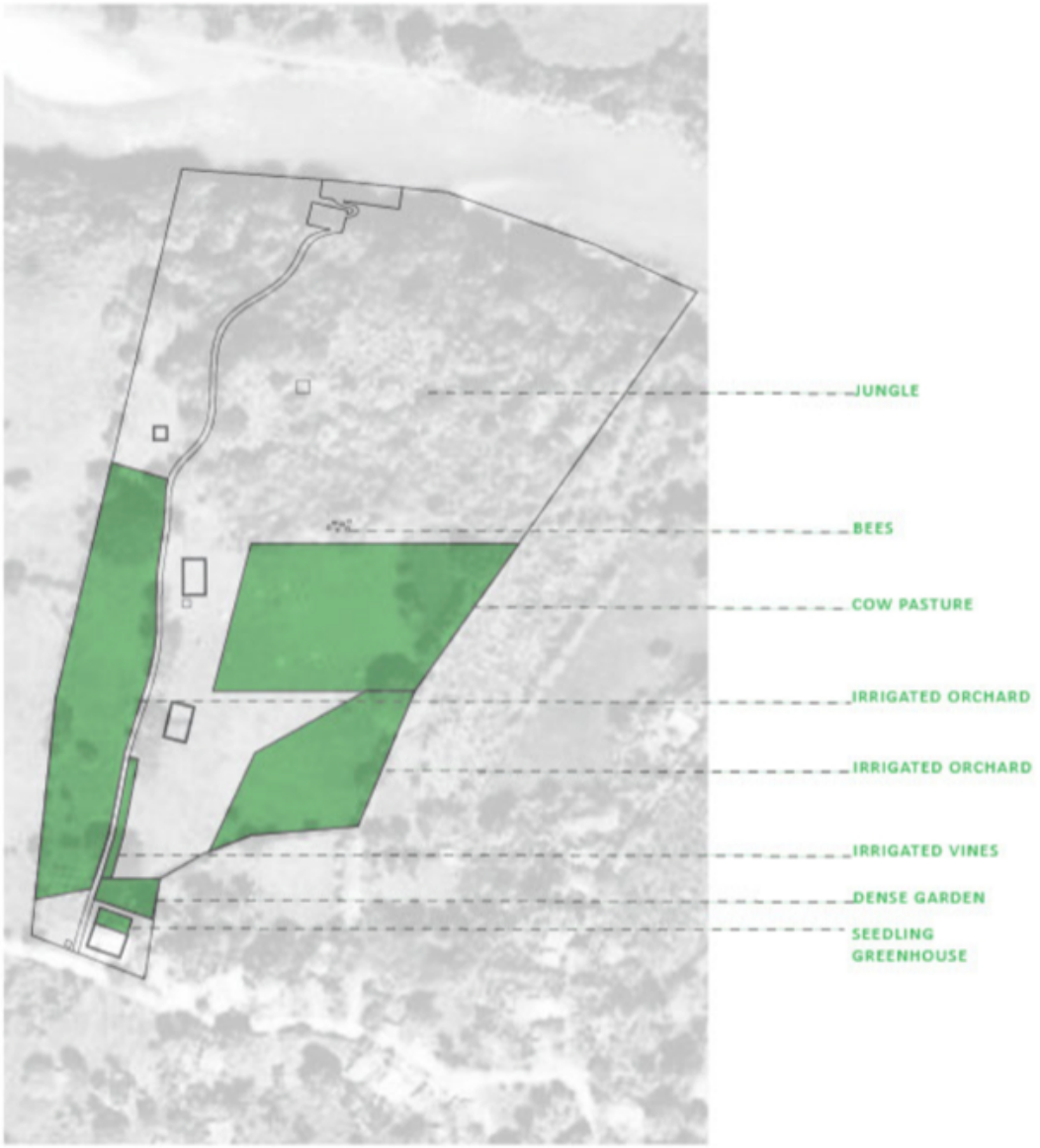
Taino Permaculture Design

By Charlie Durrant



TAINO ORGANIC FARMS

FARM MAP - EXISTING

Info

Latitude - 19*39’44.9”N
Longitude - 70*25’59”W
Altitude - 22m
Distance from Ocean - 8km (wet side of high island)
Slope - (see second map)

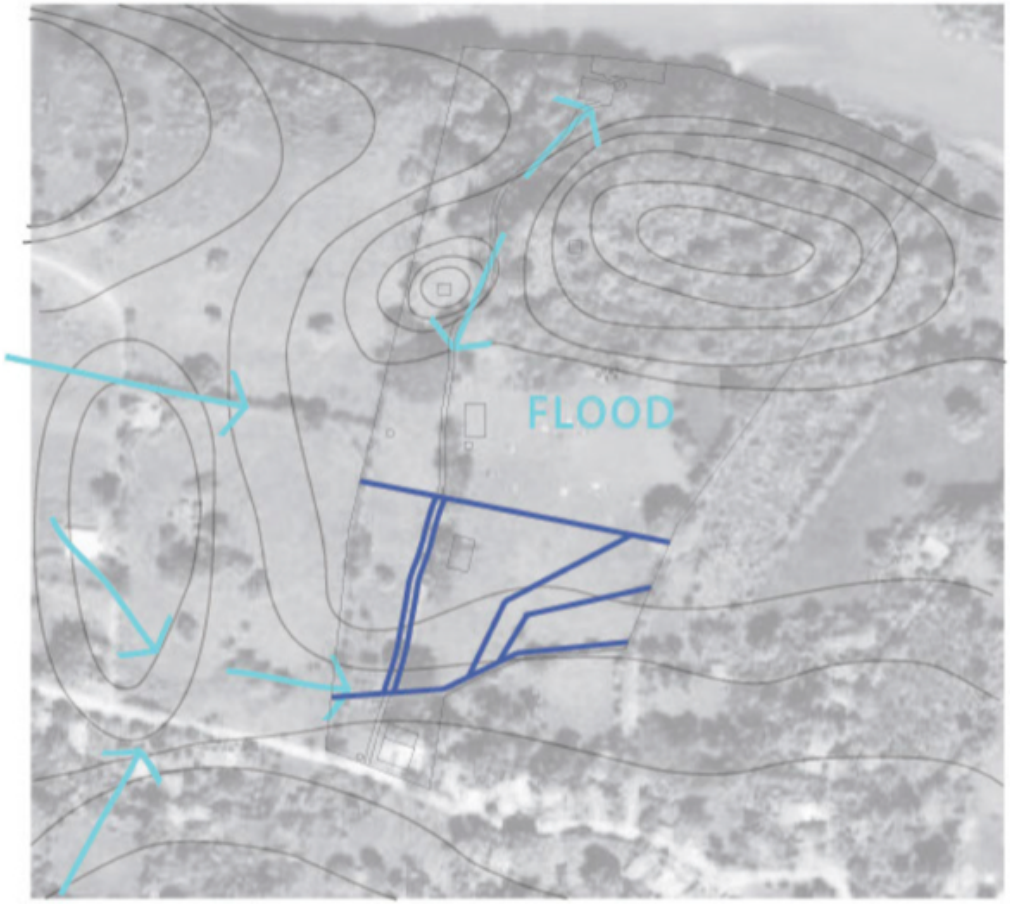
Rain Fall - 1800mm
Average Temp - 25C
Wet Season - November through January

Location

- We are on the wet side of a high island, 8km from the ocean on the north of the Dominican Republic, Central Caribbean
- We are in the tropics, meaning only subtle change in daylight hours throughout the year, consistently intense overhead sun, and heavy rainfall at times.
- Temperature increases in summer months (July-August), especially night time temps.
- We have a dryer summer and wet winter (unusual for the tropics) although we tend to get dry periods and heavy downpours randomly throughout the year.
- We receive tropical storms form the east, most frequently between September and January.
- We have fairly consistent trade winds from the east throughout the year, peaking in the drier summer months.

Main Aims

- Provide a variety of nutritious food for farm workers, Extreme Hotel staff, farm tours and sell surplus to hotel restaurant
- Grow, harvest, and process value-added products to sell at hotel & gym. (e.g dried moringa, honey, hot sauce & cottage cheese)
- Demonstrate how our needs can be met with Permaculture
- Educate and inspire

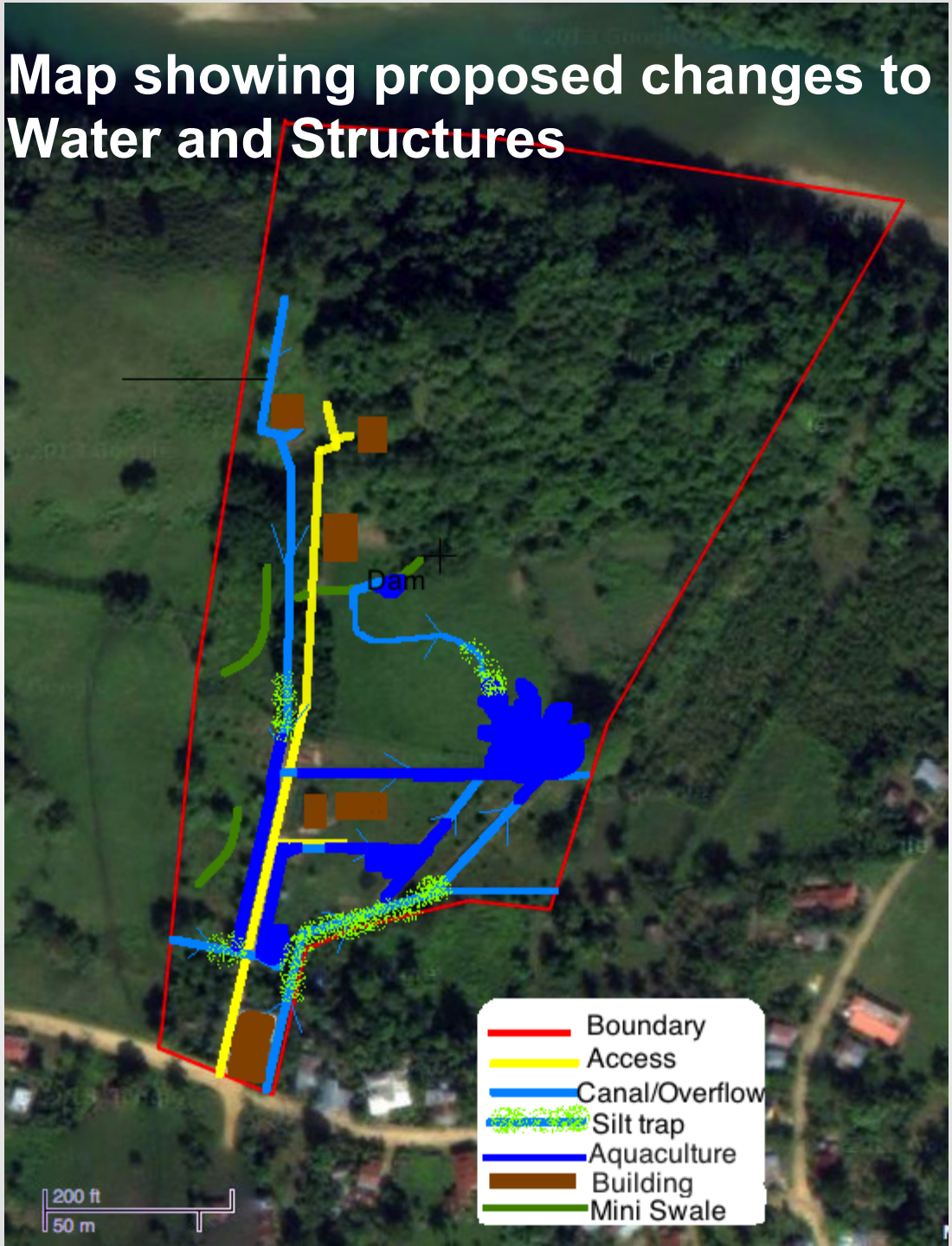


NATURAL FLOW

IRRIGATION CHANNELS

TAINO ORGANIC FARMS
TOPOGRAPHY + WATER

Map showing proposed changes to Water and Structures



Changes Explained

- Where water enters the property silt trapping reeds should be planted, they filter the water before it reaches the ponds. It can also be used as mulch.
- The silt-free water can then flow into the canals/ponds, which will be deepened & compacted to hold water year round and used for Aquaculture.
- Where the ponds and canals meet, there will be overflows put in place; this will allow our ponds to top up in smaller rain events before we allow them to flow over into the canals or directed off the property.

New Ponds

- No straight lines- lots of edge for maximum diversity and growing space.
- One of them is joined on to our main kitchen garden and so food scraps/bad fruit can go into a container where with black soldier fly larvae help with decomposition. When they are ready to pupate, they climb up along the pipe and drop out as fish food.
- Solar powered lights also used to catch evening insects for fish food.
- High wind areas, so aerated with wind pumps.
- Once a better ground cover is established in the “orchard,” we can free range ducks.

Mini Swales

- Food Forests- Adding in full swales would be more destructive than productive since the area has an established food forest and is small with steep slopes varying between 15 and 20 degrees. Mini swales will be put in to slow water and allow it to soak in. During bigger rain events water can spill over and soak passively.
- The paddock will also be fenced to allow cycling, mimicking natural herding cycles and allow the land a chance to regenerate post grazing. Mini swales will also be used on which we'll grow trees for shade and and hang over forage. (more on pasture design later).

Zonation

In permaculture we use zonation as a way of placing our focus. We have 5 zones:

Zone 1 surrounding accommodation and is the most intensely managed zone and usually the most productive, e.g kitchen garden and herb spiral.

Zone 2 is managed less frequently and so placed further from the house and so on and so forth.

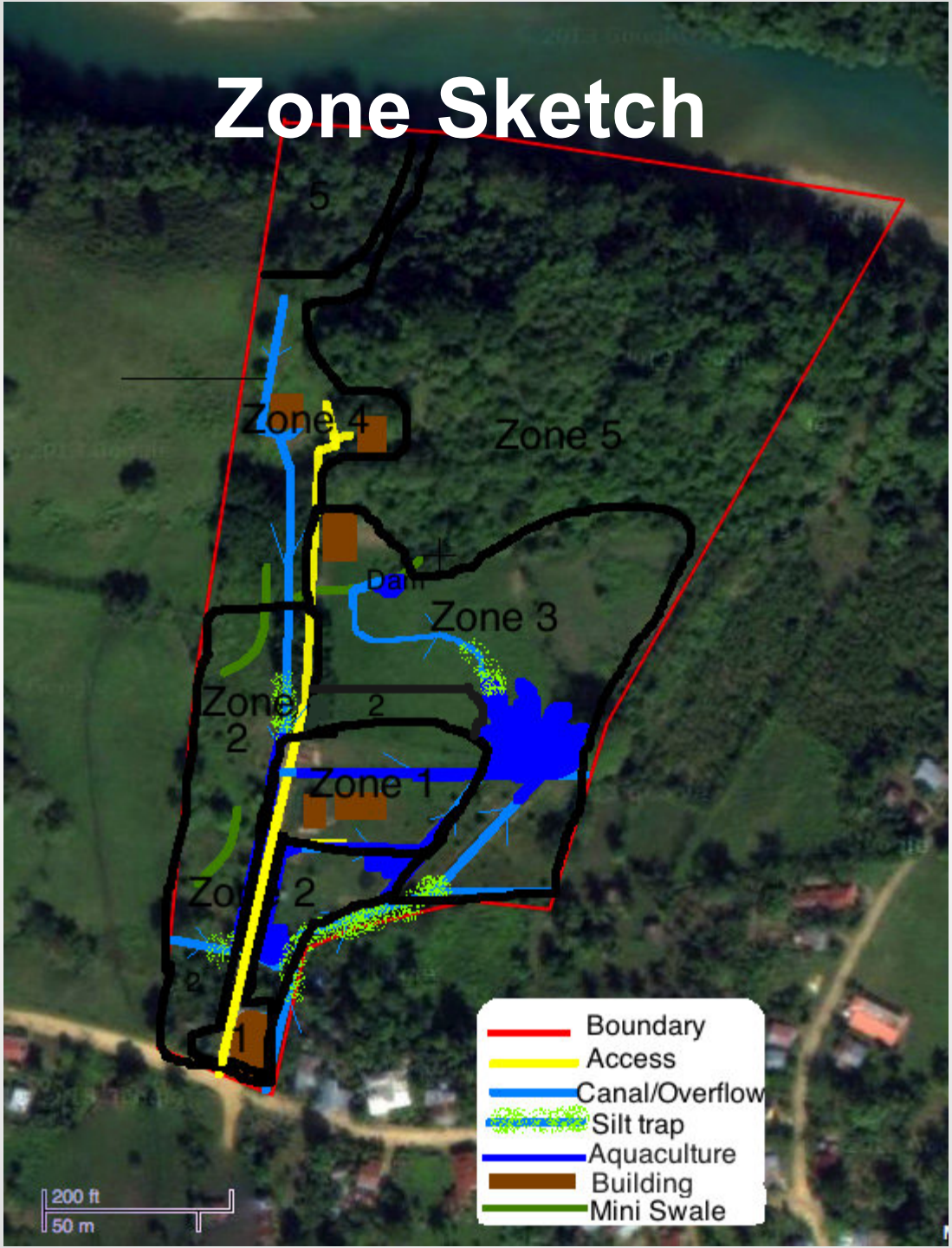
Zone 5 is left to nature although there can be still a small harvest. e.g hunting, wild berries, mushrooms and fire wood.

Zonation Continued..

So far there is little zonation set up. But essentially the new building under construction will become the centre and around it all the way to the new waters edge will become Zone 1.

This will include a kitchen garden and herb spiral designed specifically to the tropics. Zone 1 will also Include an outdoor kitchen, outdoor classroom/documentary movie theatre, fireplace, cob oven, picnic tables, shade house, composting area, and compost toilet.

Zone Sketch


5
Zone 4
Zone 5
Dam
Zone 3
Zone 2
2
Zone 1
2
1
Boundary
Access
Canal/Overflow
Silt trap
Aquaculture
Building
Mini Swale
200 ft
50 m

Zone 1

Zone 1 will also be extended at the side of the road all the way to the entrance and the original multi-purpose buildings which are to become the moringa, hot sauce, milk and honey processing facilities downstairs, and office upstairs. This road will also be the first thing people see when visiting the farm, so we want it to be abundant and also look beautiful.

We will also have small expressions of Zone 5 in the form of hedges and unmanaged clusters where natural flora and fauna flourish.

This zone is frequented multiple times every day and so is intensely managed and will also be the most productive zone.

Accommodation should be appropriate to the tropics

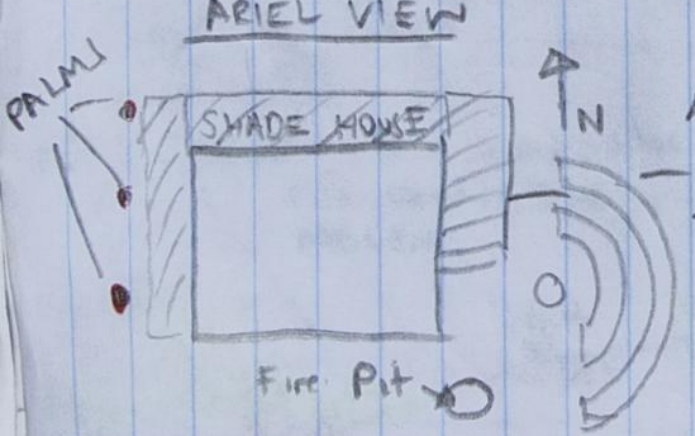
- Emphasis on shade and allowing breeze to pass through. We are in a very windy area, so planting palms, papayas, and trees will not disrupt airflow.
- Outdoor kitchen
- Kitchen garden with herb spiral
- Ideally more roof, fewer walls and concrete exposed to sun which could act as thermal mass. (accommodation is already half built, so we will work with what we have to keep heat to a minimum). Luckily we have a lot of exposure to wind usually

Accomidation

Typical Tropical Accomidation is all about maximum Air flow and minimal Thermal Mass exposed to Sunlight. OFTEN HOUSES BUILT ON STILTS WITH LONG THATCHED ROOFS AND VERRY LOW WALLS AND LOTS OF SHADE.

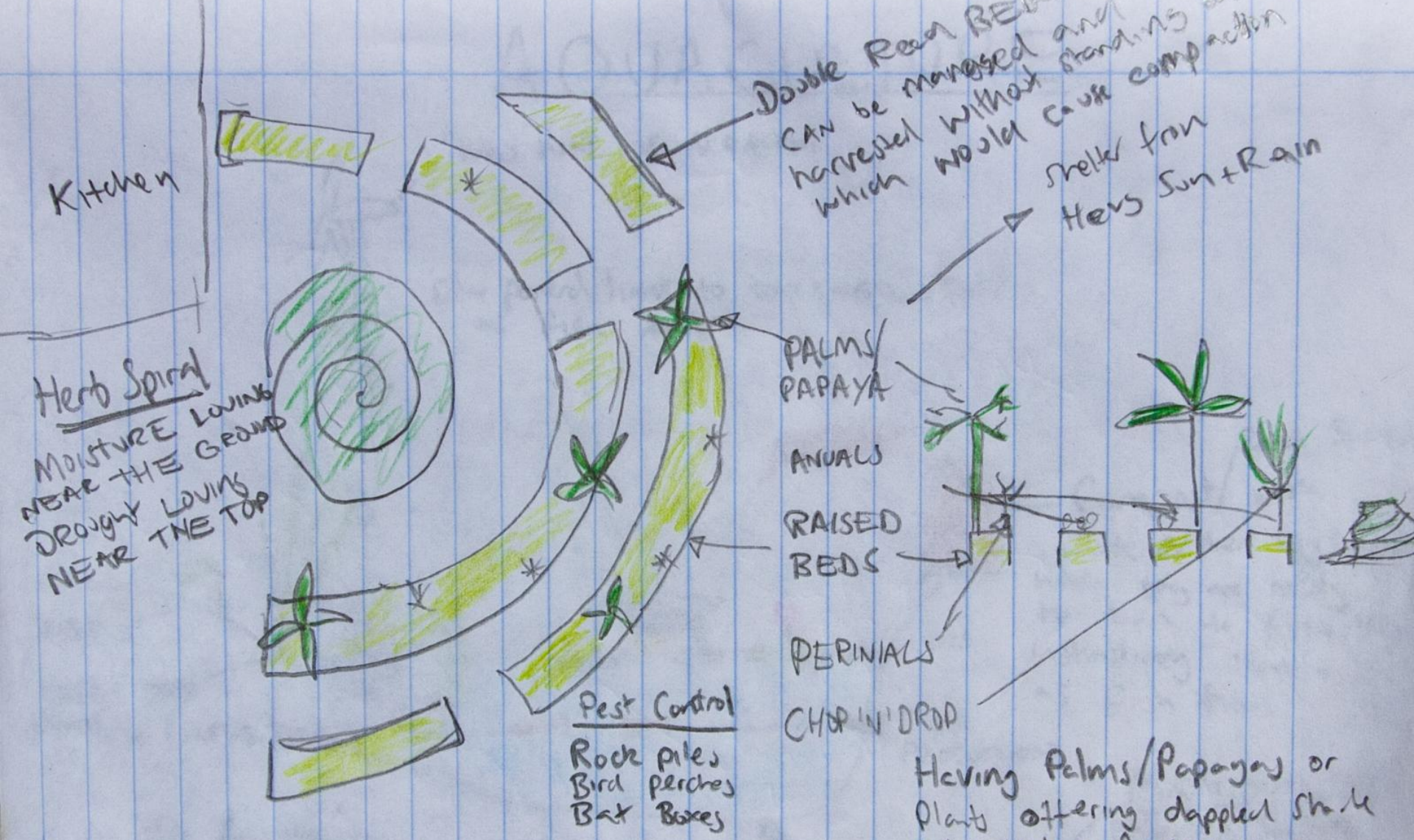
ON OUR SITE WE ALREADY HAVE 2 FLOORS OF CONCRETE BUILT, BUT WE HAVE SOME GOOD THINGS GOING FOR US. WE AR IN A HIGH WIND AREA SO WE CAN AFFORD TO GROW SHADE TO PREVENT THE THERMAL MASS EFFECT. WE ALSO HAVE SOLAR PANELS. THAT ASIDE WE CAN STILL KEEP OTHER THINGS TROPICAL SPECIFIC SUCH AS OUTDOOR KITCHEN + COMPOST TOILET.

ARIEL VIEW



OPEN PLAN LOTS OF Air flow. Vining Chinola Palms as Shade

- FUTURE BUILDINGS SHOULD PROBABLY TAKE ON A MORE TRADITIONAL TROPICAL DESIGN. IN THIS CASE WE ARE LUCKY TO HAVE WIND IN DRY VALLEY



Kitchen GARDEN

Having Palms/Papayas or Plants offering dappled shade and protection from heavy rain is ideal for Tropics. As is Chop'n'drop for continus Nutrient dense MULCH.

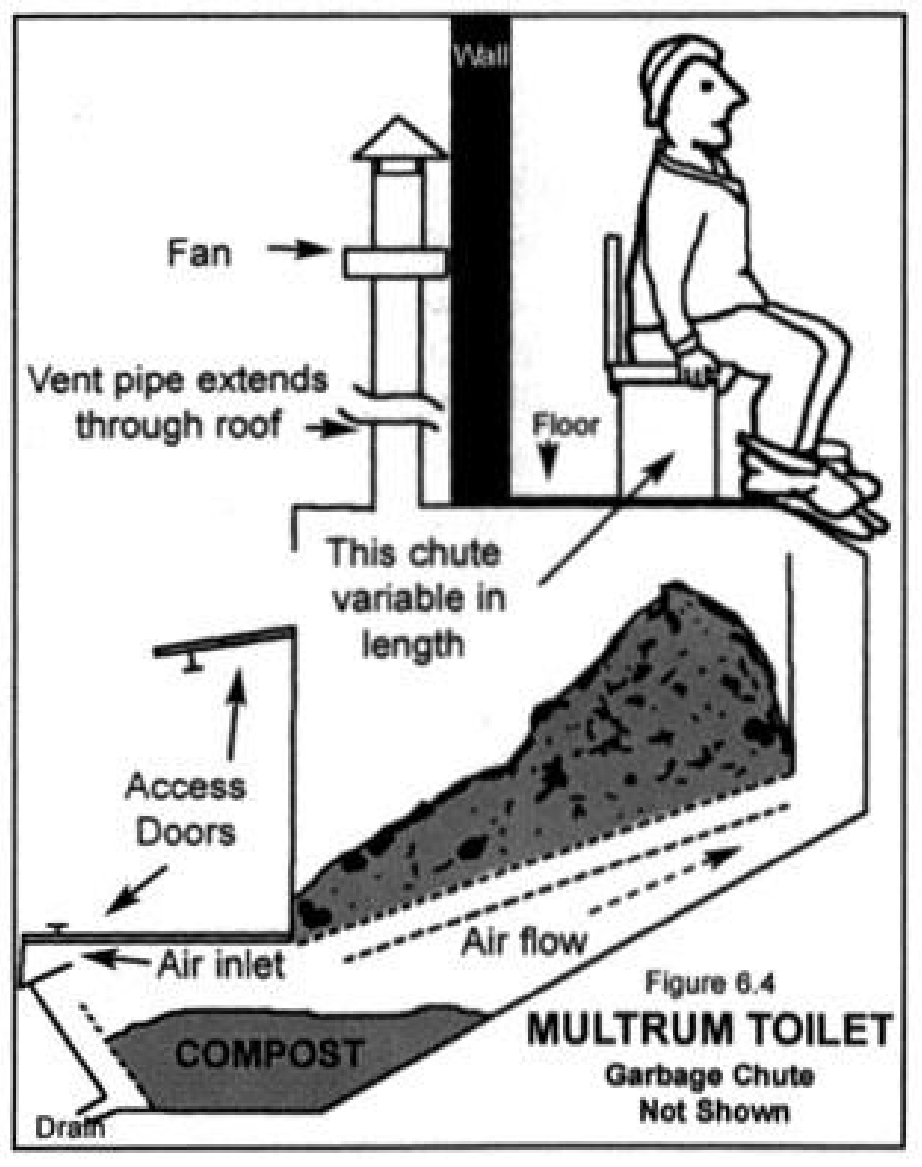
Densely planted, with huge diversity, chop + drop in there, flowers, herbs Spices, Will Look beautiful and have Large diversity to confuse pests

Compost Toilet: Ideal Design

http://catorcekt.wordpress.com/2010/12/21/dry-composting-toilet/

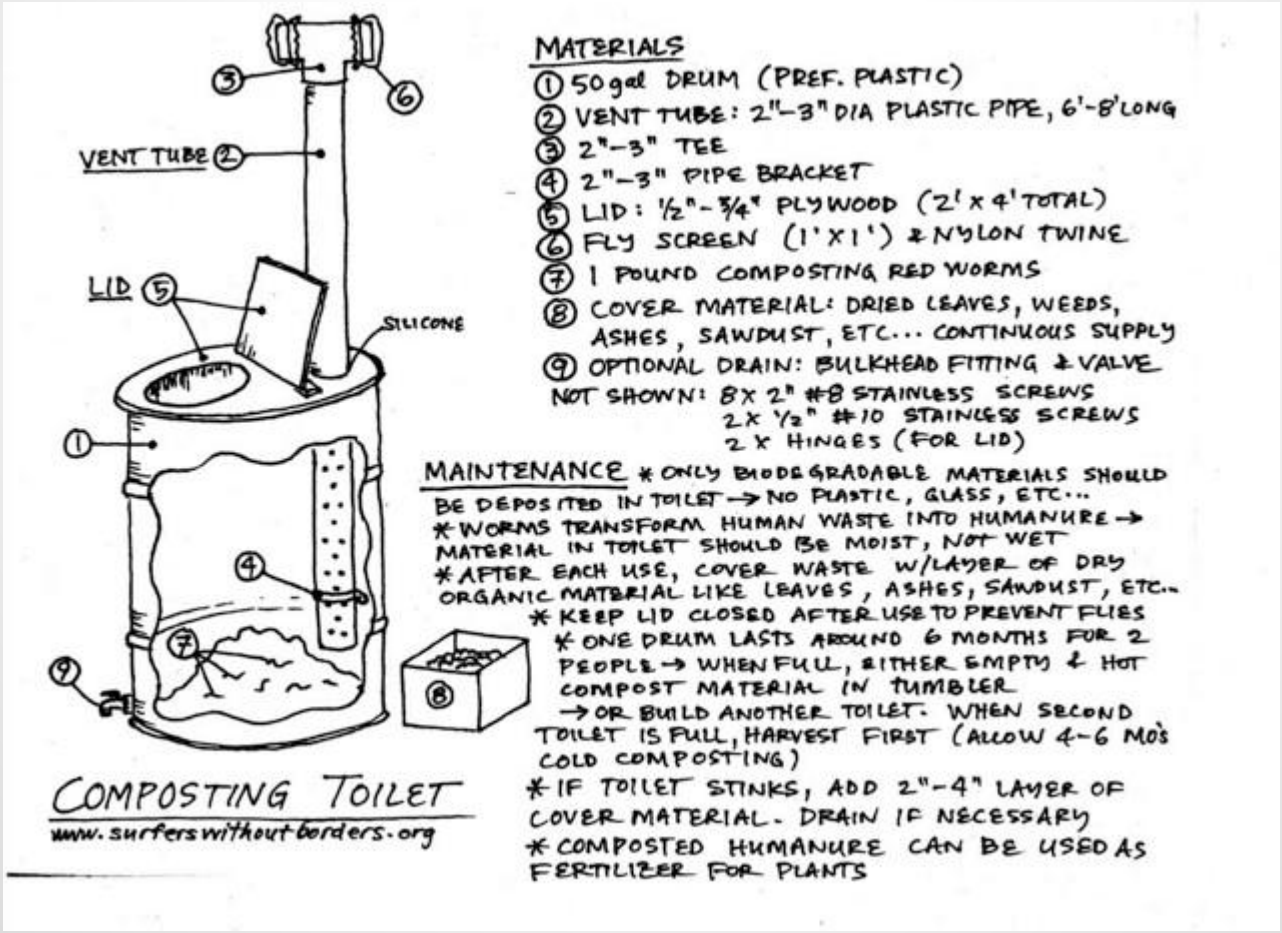
Compost Toilet: Simple Design

www.waldeneffect.org



Compost Toilet: Low budget but Functional

http://www.surferswithoutborders.org/Ecological_Sanitation.html



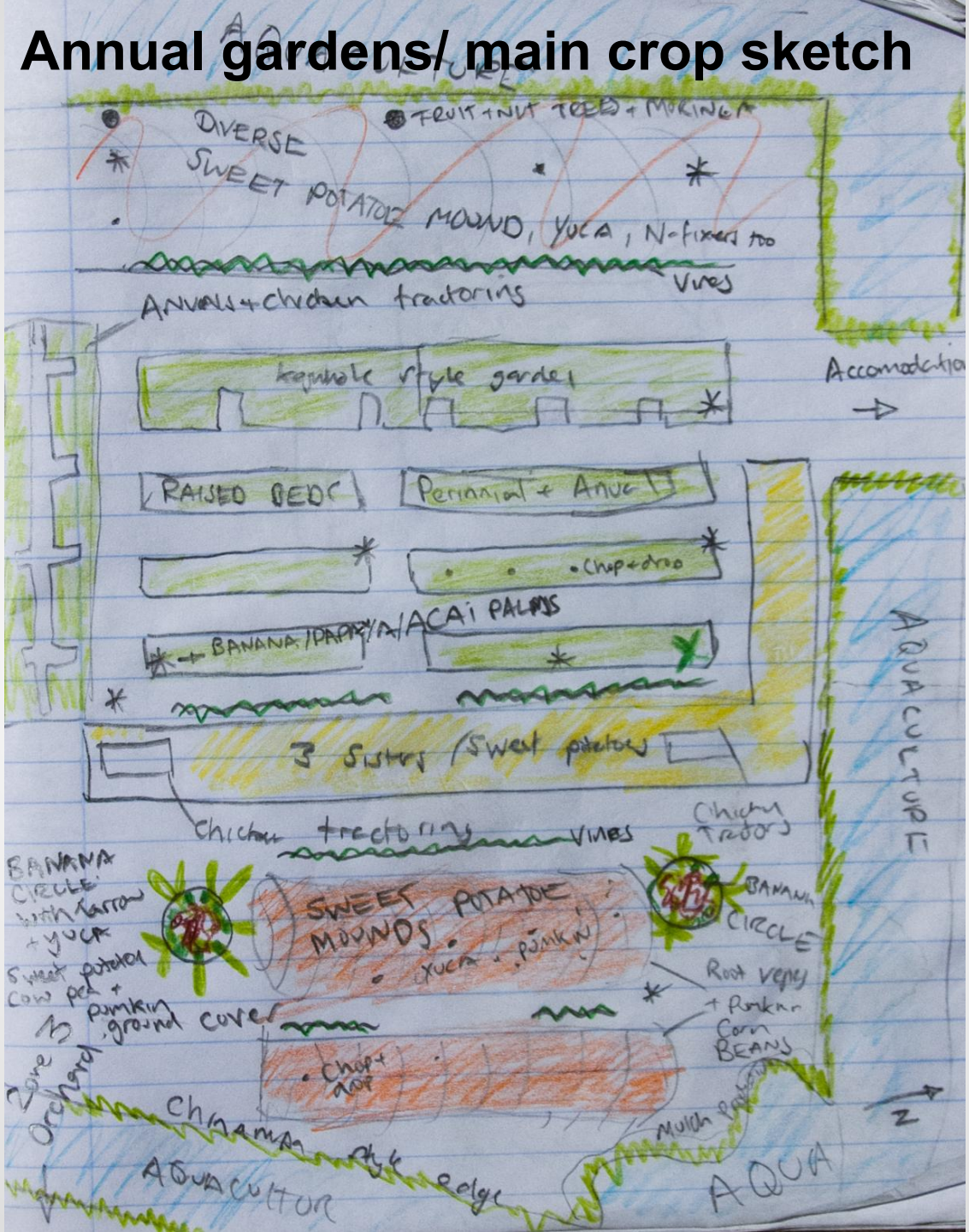
Zone 2

Zone 2 is where we have our main annual gardens, food forests, and some of our poultry.

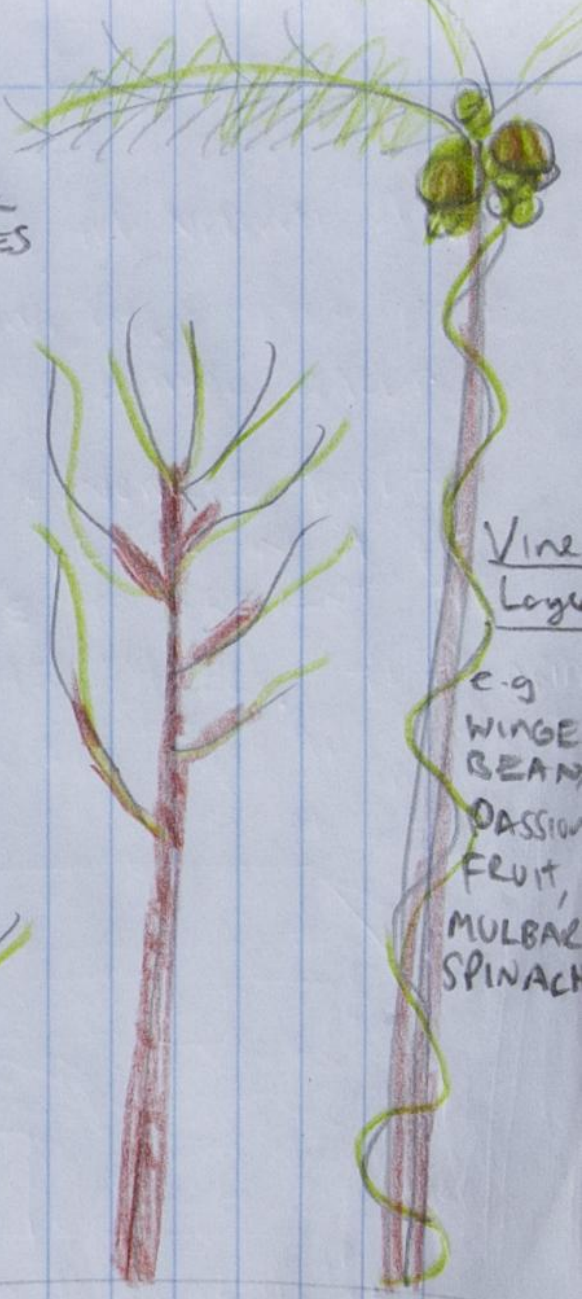
Specifically, we have food forests with multiple layers where we continually chop and drop to provide mulch and space to our most valued tree crops and benefit from the increased productivity of our edges. e.g forest to water edge, or forest to open space.

We also have aquaculture in Zone 2.

Annual gardens/ main crop sketch



FOOD FOREST LAYERS



PALM LAYER
e.g COCO/DATES

MAIN TREE LAYER
e.g MANGO, BREAD FRUIT
AVOCADO, ABIO

SMALL TREE Layer
e.g CITRUS, SURINAME, CHERRY

Shrub Layer
e.g CAJANUS HIBISCUS
Pigion Pea,

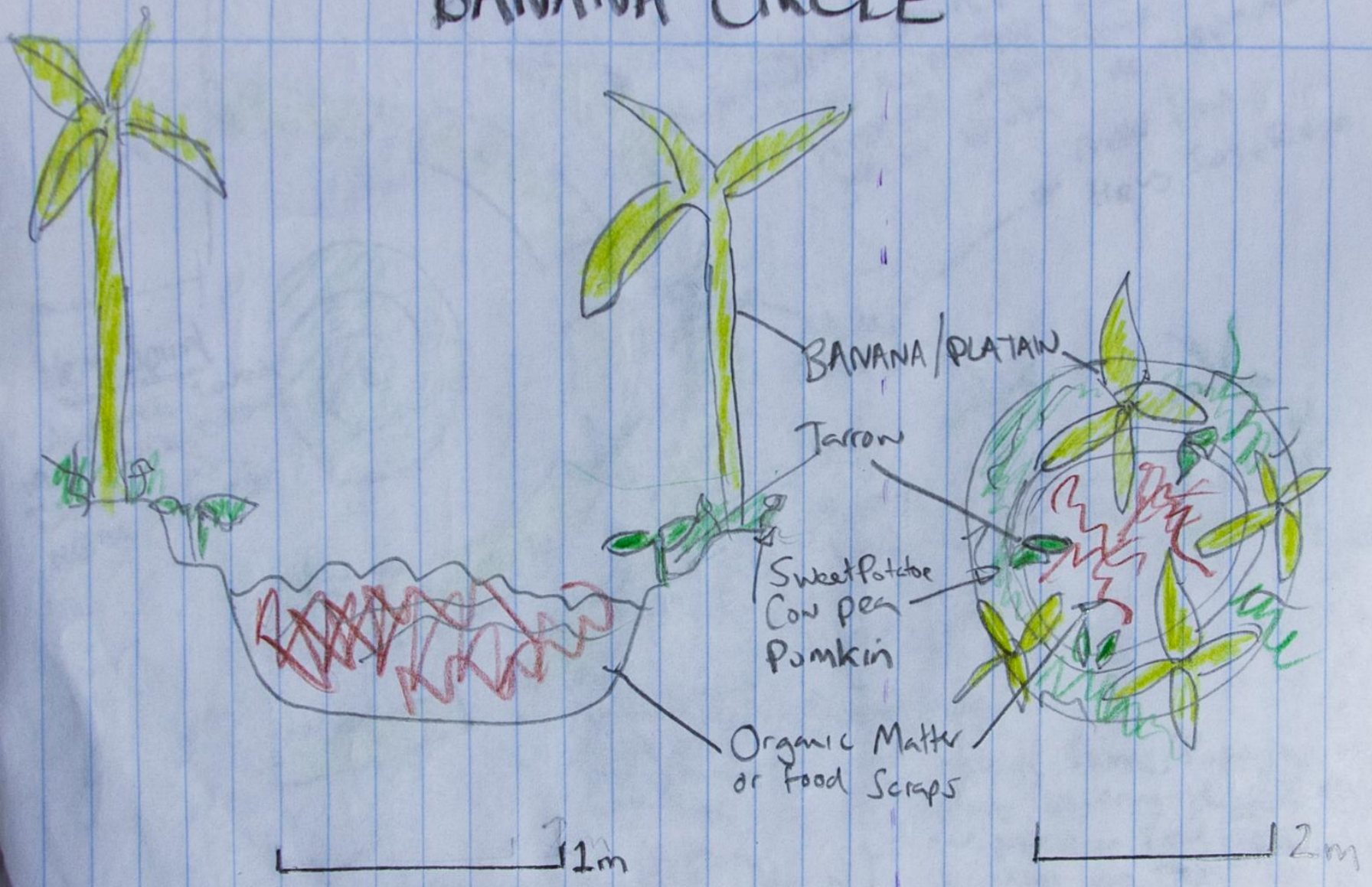
Vine Layer
e.g WINGE BEAN
PASSION FRUIT,
MULBAR SPINACH

GROUD COVER. e.g ALSO Sweet potatoe
also, BEANS, PUMKIN
MELON.

Herb LAYER

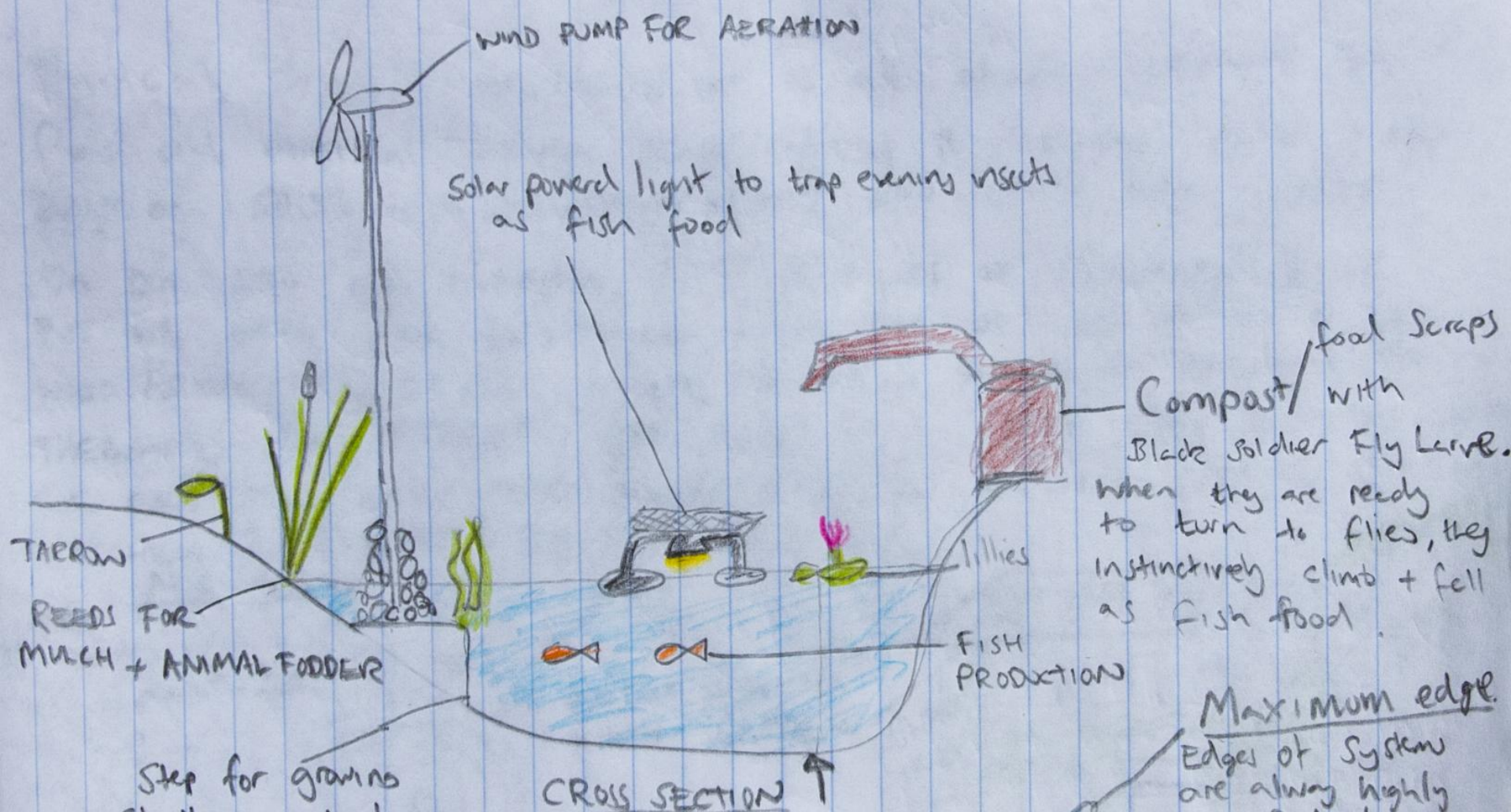
TUBA LAYER e.g Sweet potatoe, TARROW, YUCA,

BANANA CIRCLE



BANANAS COULD BE CHANGED FOR PAPAYA or PALMS, This Type of growing is called a pit garden.

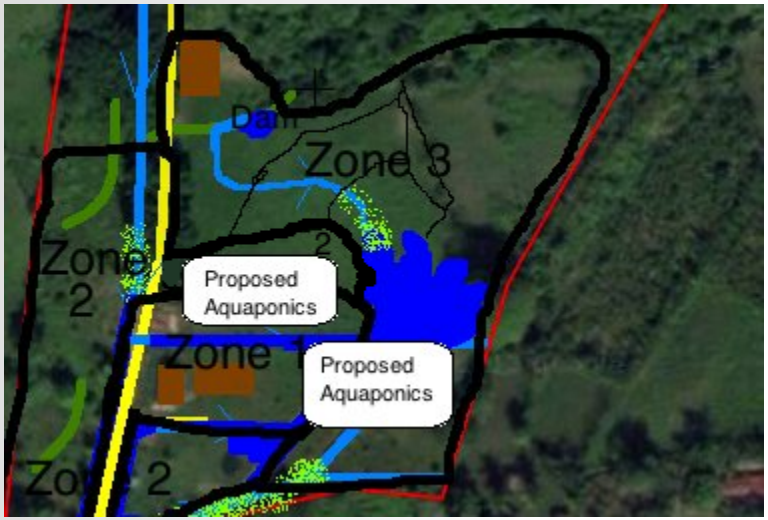
AQUACULTURE



Zone 3

Our Zone 3 will include an orchard, large pond/aquaculture, cow paddock and bees.

Changes to Cow Rotation



The cow paddock has, been made smaller allowing room for aquaponics which will help supply the restaurant with produce. It has also been cut into sections so that we can cycle the cows, mimicking the natural herding cycles in the wild. This allows areas to be heavily grazed and manured and then the land is given a lot of time to regenerate.

The borders will be planted with coppiced forage. Each new section will also have a pathway to where the main forage is grown, so the cattle can walk down the path for feeding. In between the aquaponics and the paddocks we may even put in some productive trees, such as brazil nut and Jack fruit, and along the border some more hangover forage.

Swale and Potential Ridge Dam

There is a potential for a mini swale in the paddock, which along with a kind of speed bump on the road to direct water flow. It could catch much of the water entering the property from the northwest. A ridge dam could then store this water and would function as a water for the livestock but could also gravity feed all the way to our kitchen garden and main zone 2 beds should our roofwater collections run out during a dry period.

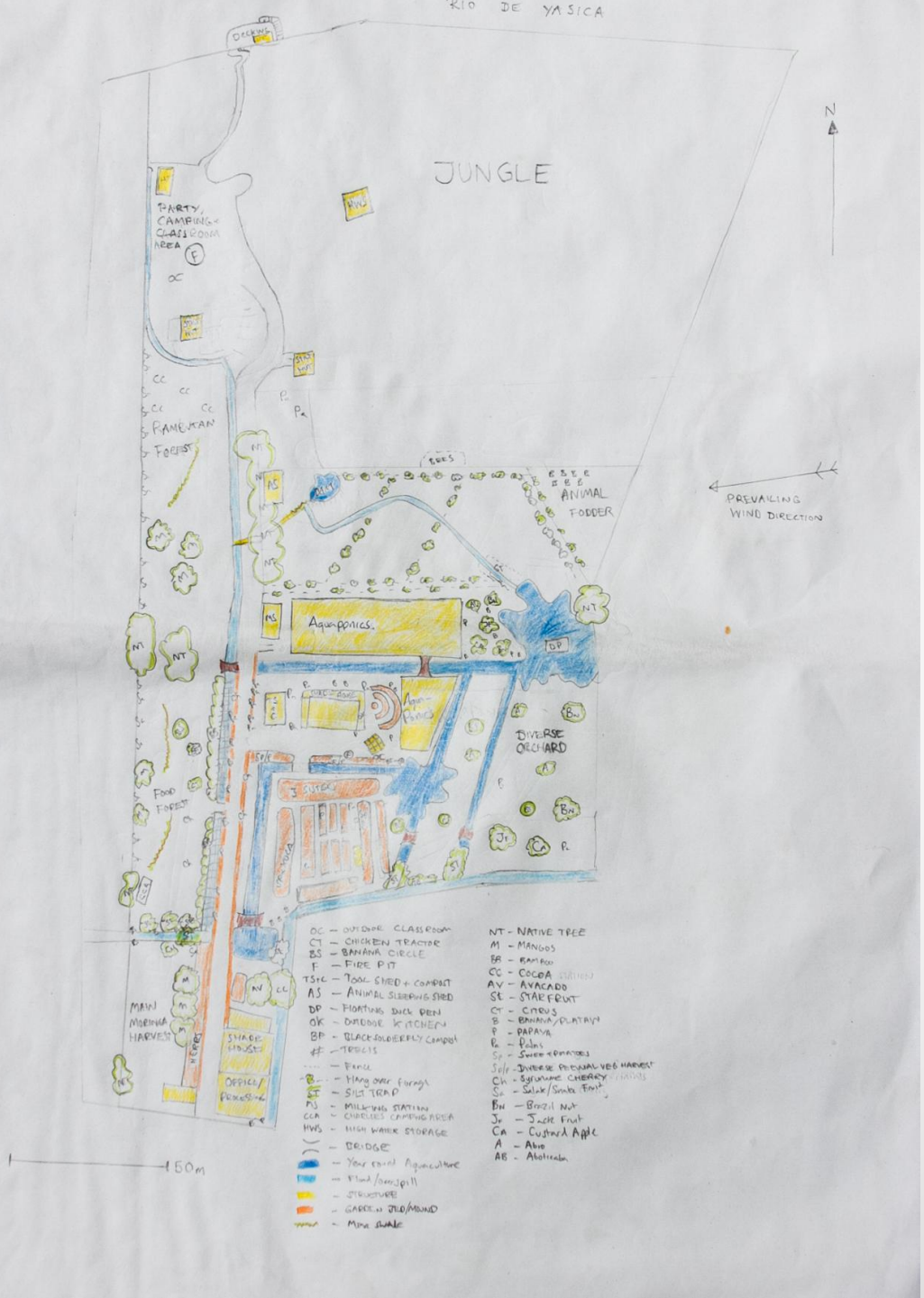
Zone 4

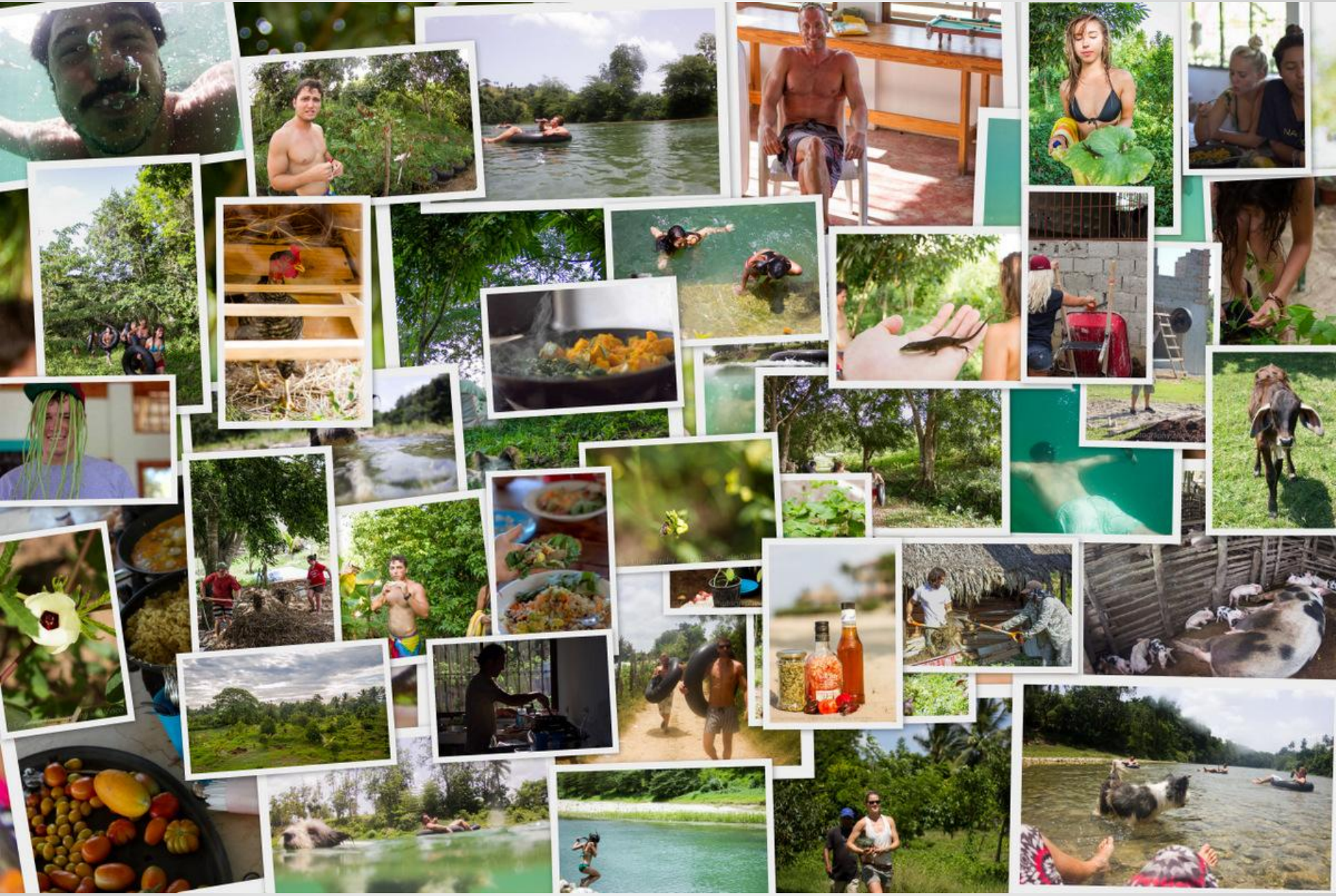
Lesser managed, we actually only have a small zone 4, in between the rambutan forest and surrounding the huts. We will continue to look after the Rambutans and of the Cocoa, but other than that, leave nature to take its course, therefore our zone 4 is more of a zone 4 with expressions of zone 5. We also have some huts for extra accommodation and a big clearing for big bonfires, celebrations and bigger group lessons as well as room for tents and hammocks for wwofers that would like some privacy from the main accommodation.

Zone 5

For us this is jungle except from a path to the river.

On its highest point It was thinned out to make space for accommodation and or a Yoga Terrace, but as this is unlikely this will happen now, only a path will be managed. Here we let natural succession take place and have a beautiful jungle in which we can observe nature and get inspired.


RIO DE YASICA
DECKING
JUNGLE
N
PARTY, CAMPING + CLASSROOM AREA
F
RAINFOREST FORESTS
TREES
ANIMAL FODDER
PREVAILING WIND DIRECTION
Aquaponics
DP
DIVERSE ORCHARD
FOOD FORESTS
MAIN MORINGA HARVEST
SHADE HOUSE
OFFICE/ PROPAGATION
OC – OUTDOOR CLASSROOM
CT – CHICKEN TRACTOR
BS – BANANA CIRCLE
F – FIRE PIT
TSHC – TOOL SHED + COMPOST
AS – ANIMAL SLEEPING SHED
DP – FLOATING DUCK PEN
OK – OUTDOOR KITCHEN
BF – BLACK SOLDIERFLY COMPOST
– TREES
– FENCE
– HANG OVER FORAGE
– SILT TRAP
MS – MILKING STATION
CCA – CHARLIES CAMPING AREA
HWS – HIGH WATER STORAGE
– BRIDGE
– YEAR ROUND AQUACULTURE
– POND/SWALE/SPILL
– STRUCTURES
– GARDEN BED/MOUND
– MAIN SWALE
NT – NATIVE TREE
M – MANGOS
BR – BAMBOO
CC – COCOA
AV – AVACADO
SF – STARFRUIT
CT – CITRUS
B – BANANA/PLANTAIN
P – PAPAYA
PL – PALMS
SP – SWEET POTATOES
SVP – DIVERSE PERENNIAL VEG HARVEST
CH – SYRINAME CHERRY
SA – SALAK/SNAKE FRUIT
BN – BRAZIL NUT
JF – JACK FRUIT
CA – CUSTARD APPLE
A – AVO
AB – ABOKADO
50m



More Ideas

Rocket Stove,
Pigs and Biogas,
Dams.