

Steep Garden



Holmbush is a house that is set in a couple of acres of land in the quiet countryside of Somerset. I was asked by friends who were living there to do a design for a particular area of the land that had been untended for some time. This is a site that provided some interesting challenges. The whole piece of land is north facing, but the area being designed is particularly steep, with little soil & a lot of rocks. At the bottom of the slope, where a polytunnel once stood, the land suddenly becomes quite flat & very marshy.

The Design Process

For this design I am going to base the process around the SADIM design framework: Survey, Analysis, Design, Implementation and Maintenance.



This was a design that I started upon while living temporarily with my friends Sue & Steve in Somerset. They had a house set in an acre of land on the north side of a steep hill. They had done a lot of groundwork when they moved in 15 years previously, to provide vehicular access

to the house & this regularly travelled route obviously became their zone 1. A lawn stretched down from the front of the house to a line of trees running diagonally up the slope & this got regular attention, but beyond these trees the land had often been neglected from lack of time & from being 'Out of sight, out of mind'.

Survey

The first part of my survey was to have a look at the land with the client (Sue; my landlady at the time), to take some photographs & go through my client questionnaire with her.



The steep slope back up towards the house - the current path goes straight up this angle!

Key Elements of Client Survey Questionnaire

1. Site size:

Approx 60 m x 35m sides, roughly triangular

2. Number of people on site and relationships:

Two; Sue & Steve (partners), plus myself (lodger) & a lot of rescued animals & birds.

3. Physical challenges:

Steepness of slope, lack of soil upon slope, marshy at bottom of slope.

4. Occupations and skills:

Sue knows a lot about herbs medicinally & some growing experience, Steve good with groundwork & building.

5. Food needs:

Garden required for some food & medicine production, some recreational space.

6. Ages:

Both later middle age, but active.

7. Financial situation:

Not very abundant, most of income goes into keeping the animals & paying bills.



One of the cats making good use of the on site resources

8. On site resources:

Lots of salvaged bits & pieces, building equipment (i.e. cement mixer), lots of rocks & stones, plants to propagate from, logs to make steps with, long grass & bramble for mulch, self-sown saplings, old polytunnel frame, food waste, manure from animals (bedding) & humans.

9. Security of clients:

Seems to be OK, have lived there 15 years.

10. Water catchment:

Marsh & pond at the bottom of the slope! Large pond at the top of the slope, though water not particularly directed into it. Log cabin & house roofs, but no rain butts.

11. Soil:

Non-existent virtually on the steep slope, just a couple of pockets of shallower slope with more on it. Quite deep, but marshy at the bottom of the slope (where it has all washed down to).

12. Aspect:

North facing, high & quite exposed. Tall conifer trees below, & for some distance, but they are not high enough to offer any wind protection. Great views over the surrounding countryside, no houses to be seen except in the distance.

13. Available utilities :

Two water taps at either end of the old polytunnel site (see base map). No other utilities closer than the house or the outbuildings (a similar distance away).

14. Addresses of local like minded people:

Terry Barker, Thornecombe (Vegan with an animal rescue focus, but interested in plants & permaculture to a degree).

15. Clients wants and needs (PASTE):

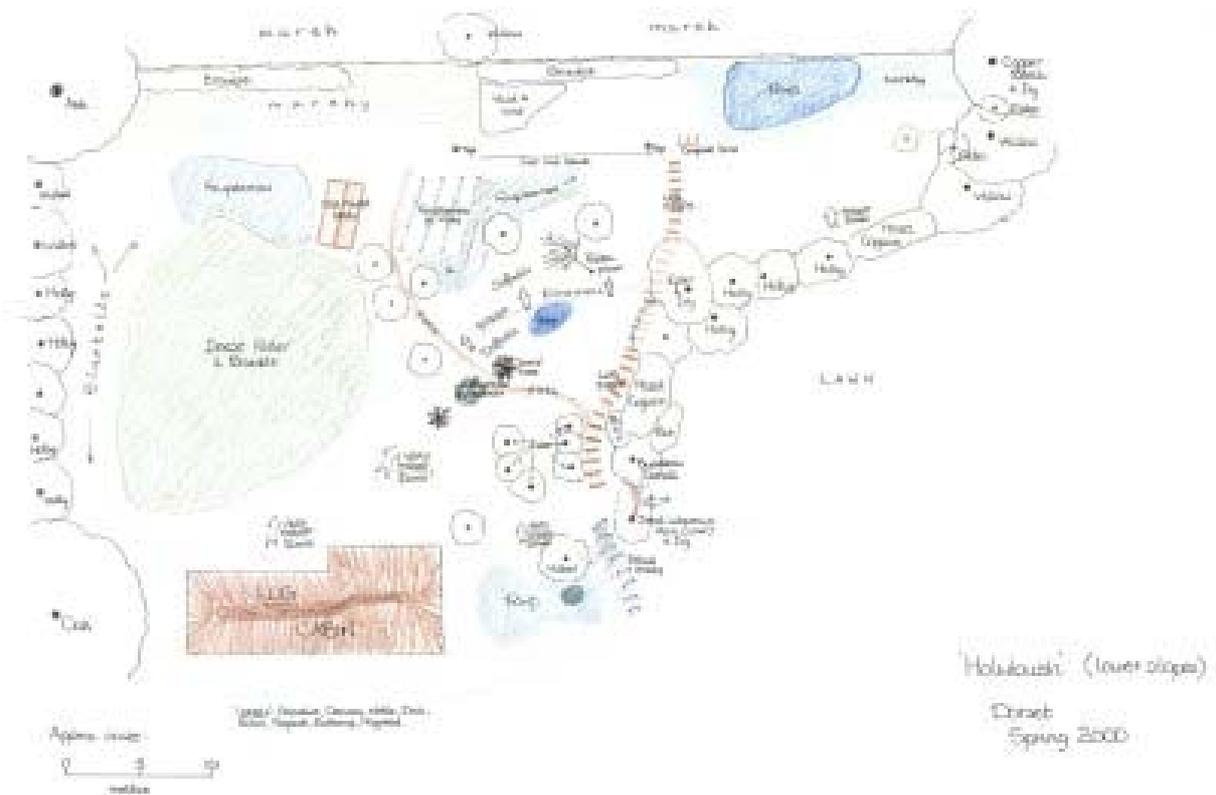
- * Fruit & nut trees.
- * Soft fruit bushes.
- * Medicinal plants.
- * Wildlife habitats.
- * Forage for chickens.
- * Quiet meditation space.
- * Pathways.
- * Secure boundary fence at the bottom.
- * Low maintenance.
- * Seats with views.
- * Nice view over garden from log cabin.



Having gone around the site with Sue, I then got out my compass & started making some more detailed measurements. I paced out the distances, taking into account the way the thick undergrowth was shortening my paces & I measured some angles by taking bearings with my compass. The slopes were quite complex & varied from very steep at places near the top to quite shallow near the bottom. As I was going to be on site implementing the design I didn't feel a need to contour it at this point, so I just made notes about the steepest areas & the general direction of the slope.

The precise placement of elements on the site would involve a certain amount of intuition too & so the map was to be more of a guide to work from. I made notes on what existing vegetation & features there were on the site & then headed back up the hill to start putting it all down onto paper.

This was the first time that I got to use my 'new' technical drawing board. I had mentioned to Steve that I was looking for one if he ever saw one going cheap. A couple of days later he turned up with one on the back of his pickup that a friend was 'throwing away'.... how often does that happen? It was a very nice surface to work on; making a change from a floor & after a couple of hours drawing I had myself a base map of the area to be designed.



The site was clearly bounded on the west side by a fence down the hill under a line of mature trees. The southern boundary consisted of a three foot high wire & post fence. These two boundaries were with neighbours. The third boundary was the line of trees going diagonally back up the hill & the other side of this was the house lawn.

To the south at the top of the hill was the log cabin & the large pond & this was unfenced, although too steep to negotiate easily.

Certain plants were already thriving on the site; there was a very healthy stand of raspberries near the bottom of the slope, where the nutrients were clearly accumulating. It had suckered around the immediate area, but stopped just above where the soil got marshy. There were a number of small trees dotted around & a large stand of Elder & Bramble at the west end of the slope, providing plenty of habitat for wildlife. A Kiwi & a Grapevine that were originally inside the polytunnel were now entangled around each other & thriving outside of it.



A very healthy looking Willow just the other side of the boundary fence made it clear that they would do well here. At the top of the slope, the log cabin had a balcony area overlooking the site & french doors to access it from inside, but no access from there to the garden below. It had a thatched roof, but no guttering. The pond next to it was home to a lot of plants & wildlife, but had no drain into it or out of it. The site was also foraged by the rescued chickens that had free range all over the land.



The log steps were still basically sound, though they did need renovating in a couple of places. The path off down to the left had clearly evolved just from the desire to take a shortcut to the other end of the polytunnel or the raspberries & not yet been stepped in the same way. There were sections where it was easy to slip & fall. The metal scaffolding poles that the polytunnel alkathene piping frame was originally placed upon were still hammered into the ground at intervals of a few yards apart along the bottom of the slope. The slope overlooks marshland & forestry belonging to a big estate, but no dwelling.

Analysis

This is clearly a zone 2 space & currently only has one entrance & exit path. This comes down the hill & then splits, heading directly for either end of where a polytunnel was once sited. This was obviously the main reason for going down to the site before & now that the polytunnel is no longer there, it has become overgrown. It needs to be made much more inviting as it is not currently a route through to anywhere else & at least one new exit would help with this I feel. A couple of extra routes through the garden would give better access to the trees we are planning to plant & more options on where to walk & look at the views.

While there are species that will grow on the steep slope, it makes sense to also try to stop the erosion of soil down the hill. I need to catch the run off water & the nutrient rich humus (leaves etc.) & keep it on the slope where it is needed most. This I could do by digging out small swales across the slope & planting trees along them. The swales could double as contouring paths as the ground is currently so stony. The marshy area at the bottom of the slope is clearly very fertile (& having had a polytunnel here in the past would have meant that the soil was cultivated too). Choosing species that could take advantage of this would make the most of this potentially productive area. Because of the scale on which we are working & as we are in zone 2, the plantings should generally be big; trees & shrubs etc. The pond similarly needs big plantings of species that will take care of themselves, yet preferably also provide a crop & look nice too. To reinforce the boundary at the bottom of the slope, I could plant some more thorny shrubs. The bramble already does this to a degree & is productive, but there are still plenty of gaps to fill in. Everything needs to be low maintenance.

The old raised beds could still be utilised for growing easy annuals, such as squashes which also have the space here to romp across the landscape. The dense thicket of Elder & Bramble provides an excellent habitat for wildlife already, plus some stability at the west end of the slope. This is a great area to watch wildlife or come to be in a quiet place; the fact that noone does come here en-route to anywhere else makes it a good place to retreat. A little space specifically for meditation would be ideally placed here & a few seats for enjoying the views would also encourage human visitors.

Being a little way from the house means that this would be an excellent camping space for one or two tents in the right places & as Sue & Steve run regular courses here, it could be used regularly. A treebog here would also provide a campers loo & if it were accessible from the house side could be keeping the human fertility where it was needed; on the land. Fertility can also be spread by the chickens as they foraged, they could be encouraged to come to this area by planting the right species for them.

Planting:

There are two distinct habitats on the site; the steep rocky slope & the flat marshy area & each of these need appropriate planting schemes. Being north-facing adds a further constraint on what will thrive here, but I can see from a few existing species here & further up the hill, what already does well. I can use this information to select a few more species to try that like similar conditions to those that are already here. My first stop for information after my own memory was the excellent Plants for a Future database, with this I was able to do a search of species suitable for different habitats (i.e. north-facing, bog garden etc.) & then see which ones would be best suited to the conditions. While there are plenty of species that do well in marshy ground, there are other factors to consider here like the almost total lack of direct sunlight in the winter months. After a bit of research I was able to come up with a list that I could at least start off with.

I generally looked for plants that were easy to propagate from seed (especially those that I could gather from the wild; Meadowsweet for instance) or that were not too expensive to buy. Despite this Gunnera still managed to get onto the list, but then seeing so many of them growing in the South West of Eire had me keen to get one myself at the time & planting one at Holmbush was the next best thing.

I then remembered a guild for a north facing slope described on my design course & so I had a look through my notes. It involved planting cherry trees on the slope & using Alder & Willow at the bottom of the hill to utilise the nutrients there.

This seemed an ideal opportunity to try this one out, although I did double check that it referred to north facing slopes in the northern hemisphere & hadn't just been lifted from an Australian text! Although the guild seems to be referring to a commercial situation (i.e. including packing for the fruit), it could still be applicable to us here. Having gathered together the elements that I would like to include I now needed to place them all.

Needs of components:

This list covers just the elements that are needed within the boundaries of the site. For this reason I am not including the shelter needs of the resident humans or the chickens for instance as these are already provided elsewhere, but I do consider what they might want from visiting the site itself.

Campers: Flat, dry area for tent, access to water tap, close to, but not too close to treebog, nice view.

Chickens: Forage plants, herbs, water.

Human 'visitors': Pathways, seats, quiet space, places to watch wildlife, food, medicine, materials (craft & building).

Log cabin: View of the site, access down to it from balcony.

Meditation hut: Quiet space, access path, privacy.

Pathways: Gentle slopes or steps, good secure & well drained surface (stones), seats for enjoying views, access to areas needing most attention or of most interest (i.e. best views).

Pond: Inflow of water & fertility, plants, pondlife, water retaining base.

Raised beds: Water, fertility, mulch, plants (or seeds).

Swales: Water, stones for surfacing, trees for stability, contours to follow.

Treebog: Dry, fairly level ground, away from low tree canopies, easy access from house & camping area, supplies of cut grass or sawdust or earth.

Trees & shrubs: Water, sunlight, air, fertility, mulch, companion plants, favourable microclimate, some human attention.

Wildlife: Habitats, food plants, water.

Connections between components (Relative Location):

From this list I can see that certain components need to be placed together for mutually beneficial connections to be made.

Swales/Pathways/Trees & shrubs: Keeping the pathways along the contours of the steep slope, also allows them to act as swales which capture water run-off. Planting trees on the downslope side of the path provides stability & starts to capture nutrient rich debris. The stone on the slope can provide a free draining surface & the pathways ensure that people regularly pass the trees to maintain them. Shrubs & companion plants can add further stability to the slope & create beneficial guilds to increase growth, provide shelter from winds for young trees etc.

Camping/Taps/Steps/Pond/Flat ground/Treebog: The campers will need a dry flat piece of ground to pitch a tent, with access to water & the treebog. The old polytunnel site will be well drained & flat & will support the growth of dwarfing fruit trees & shrubs to divide the area into camping plots. The treebog needs to be used by the campers. The steps down the slope provide direct access to the campsite. The hedge provides shelter & privacy. The nearby pond is lovely to look at & nice views over the surrounding countryside are to be had just up the slope.

Wildlife area & Meditation hut: Both want to be out of the main flow & quiet. The bottom west corner furthest from the house appears the obvious site, with the Elder & Bramble thicket already growing there.

Chickens/Fruit trees & shrubs/Forage plants: The chickens provide pest control & fertility to the trees & shrubs. The trees & shrubs provide windfall fruit & insects. The forage plants provide food for the chickens & maybe also good companions for the trees & shrubs.

Treebog/Raised beds/Soft fruit/Slope/Log cabin/Campers: Putting the treebog within good access of the log cabin & the campers & still accessible on a direct path from the house maximises it's inputs. Outputs can be utilised not only by the Willow around it but by Comfrey planted downslope of it to absorb excess nitrates. The Comfrey can then be cut & used on the raised beds & around the soft fruit. Access from upslope avoids the need for steps. A rainbutt fed from the treebog roof provides water directly to the raised beds.

Upper pond/Pipe/Pelton wheel/Lower pond/Treebog/Meditation hut: A project for the future maybe to make use of the energy resource stored in the upper pond? A steep slope such as this is a prime site for a Pelton wheel to generate electric power to light the treebog &/or the meditation hut.

Other Permaculture Principles:

A few examples of where the design follows some of the other principles of Permaculture:

Minimum effort for maximum effect: Planting Willow wands in the marshy bottom land. Building a treebog creates a reason for daily visits to the site, deals with waste (inc wood ash) & provides fertility which is turned into food. Using treebog roof catchment to provide water to raised beds. Make the camping area nice & then advertise for WWOOFers!

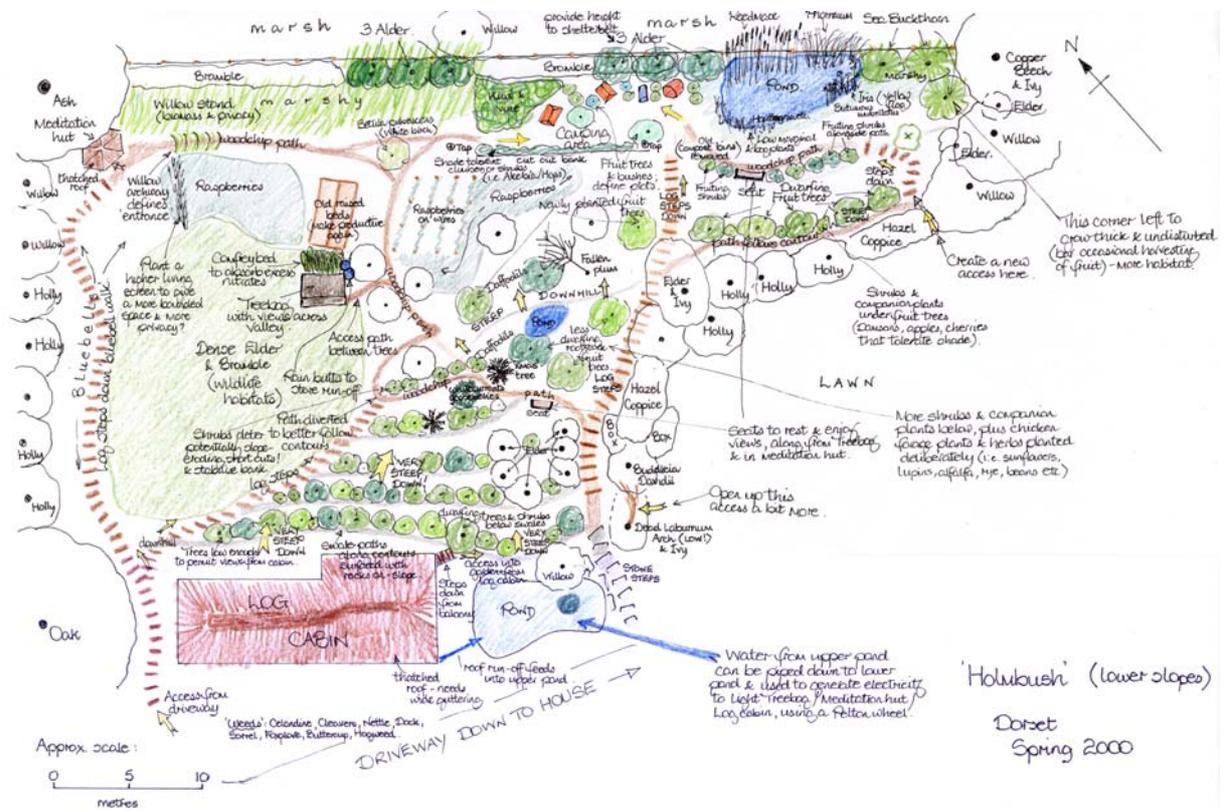
Multiple supply: Planting different varieties & species of fruit trees. Water available from direct rainfall, upper & lower ponds, rainbutts fed from & treebog roof (log cabin's fed directly into upper pond) & water taps.

Multiple yield: Pathways can also double as water collecting swales... or is that the other way around? Shrubs & plants provide shelter & beneficial companionship to young trees, plus slope stabilisation & also a crop. Willow provides waste processing, shelter & building materials, Sea Buckthorn shelter, stockproofing & fruit.

The problem is the solution: Having no through route to anywhere else makes the site an ideal quiet place for meditation or reflection. The stones all over the land will make good path surfaces & bed edging. The steepness of the slope can be used to generate power by running a pipe between the upper & lower ponds & inserting a small Pelton wheel in the flow.

Stacking: The temporal stacking of plants (choosing seasonal varieties of fruit trees & bushes). The vertical stacking of plants & trees (utilising all the seven vertical layers of growing space).

The Final Design

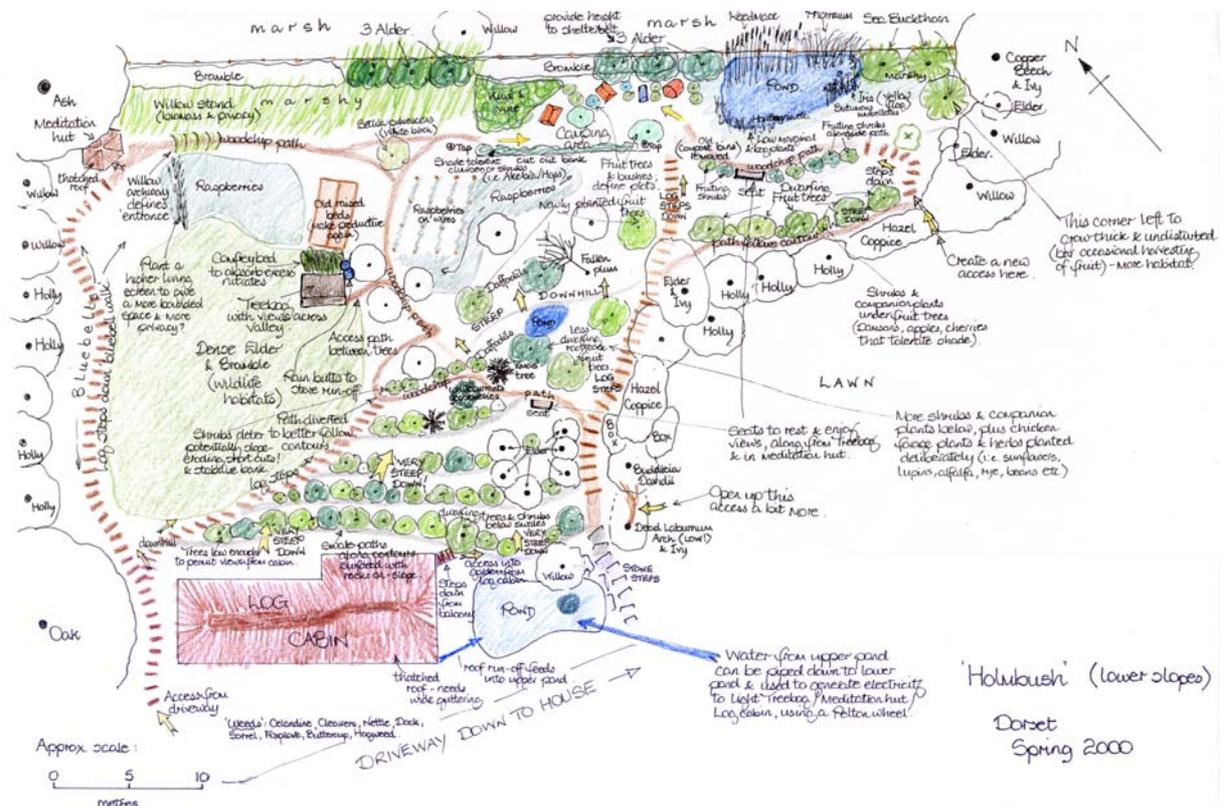


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The Final Design



Here is my final design; as it is too small to really be seen properly here, I have broken it up into sections & magnified them for greater clarity. I have left the existing elements (i.e. trees) not coloured in to provide more clarity.

I have left most of what is already there on the site as part of the design. Firstly, any growth that currently exists on the slope is providing stability & it would be foolish to remove it for no good reason. Where I have made alterations they are minor & because I have needed to; to make space for a more functional element (i.e the treebog) or make it safer (i.e. pathway changes).

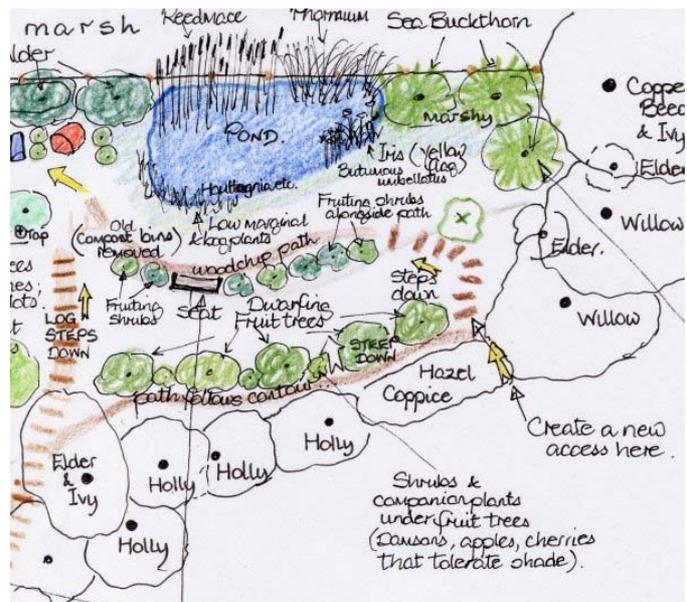


Here I have utilised the flat ground at the bottom of the garden which was previously cultivated in the polytunnel for the camping area. It is in the most sheltered spot at the bottom of the slope & easily accessed via the existing log steps. There are already taps at that place I am planting dwarfing fruit & nut trees & soft fruit to divide up the area into camping plots. These will make good use of the fertility

in the soil here & I have also planted climbers on the cut out bank that will tolerate the north-facing aspect. Along the boundary I have planted some Alder trees to take up some of the moisture in the ground & ultimately provide some higher wind protection than currently afforded by the Bramble. Planting more trees further up the slope here will reduce the run-off onto the camping area.

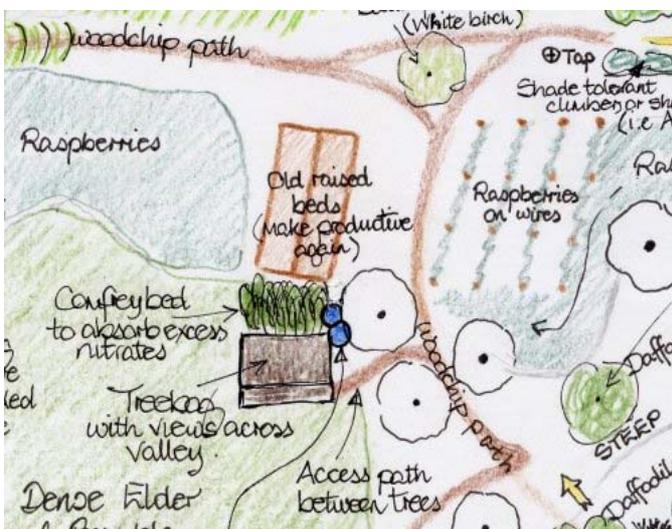
Hopefully this, along with the trees planted around the camping area will stop tents from getting flooded in heavy rain. The area has access from either end, allowing the campers to visit the pond or walk up to the house in one direction or visit the meditation hut or use the treebog in the other.

The pond area is adjacent to the camping area & provides a lovely view for campers to look out over. I am providing a seat here for those who would just like to sit & watch the wildlife. The pond is planted up with big, strong plants that will look after themselves, such as Reedmace, Phormium, Irises & Flowering Rush. These are all useful plants to have for production of food & materials & they also add to the windbreak across this boundary. I am planting low plants on the south side to allow the maximum light to reach the water & the plants at the back & to keep the view of the pond fairly open.



I am planting Sea Buckthorn in the corner to further shore up the boundary, provide some high vitamin C berries & to create more impenetrable (to humans) wildlife habitat. I have made a new access through the hedge from the lawn to give better access to & from the house & I am planting fruiting shrubs alongside the path, where they will be regularly attended to. Another new woodchip path runs along the top of this part of the slope & fruit & nut trees are being planted below it where they can also be easily maintained.

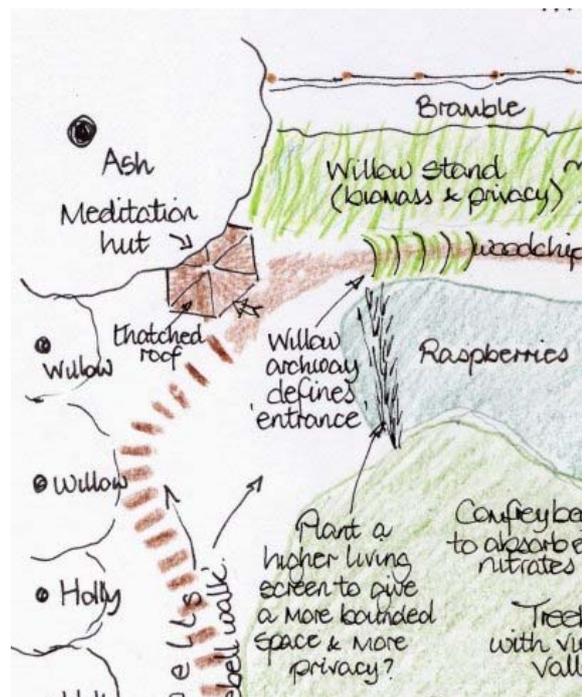
One of the few alterations I am making to what is already on the site is to cut away some of the Elder & Bramble to accommodate the treebog. This is within easy reach of the campsite & the log cabin & improving the path from the house maximises its input potential. I am planting a stand of Comfrey downslope of it to absorb excess nitrates & this can be cut & put on the raised beds or around the soft fruit.



Rain butts collect the run-off from the roof & store it for later use on the raised beds. The access to the treebog is between two existing trees & directly onto a platform at ground level on the upslope side.

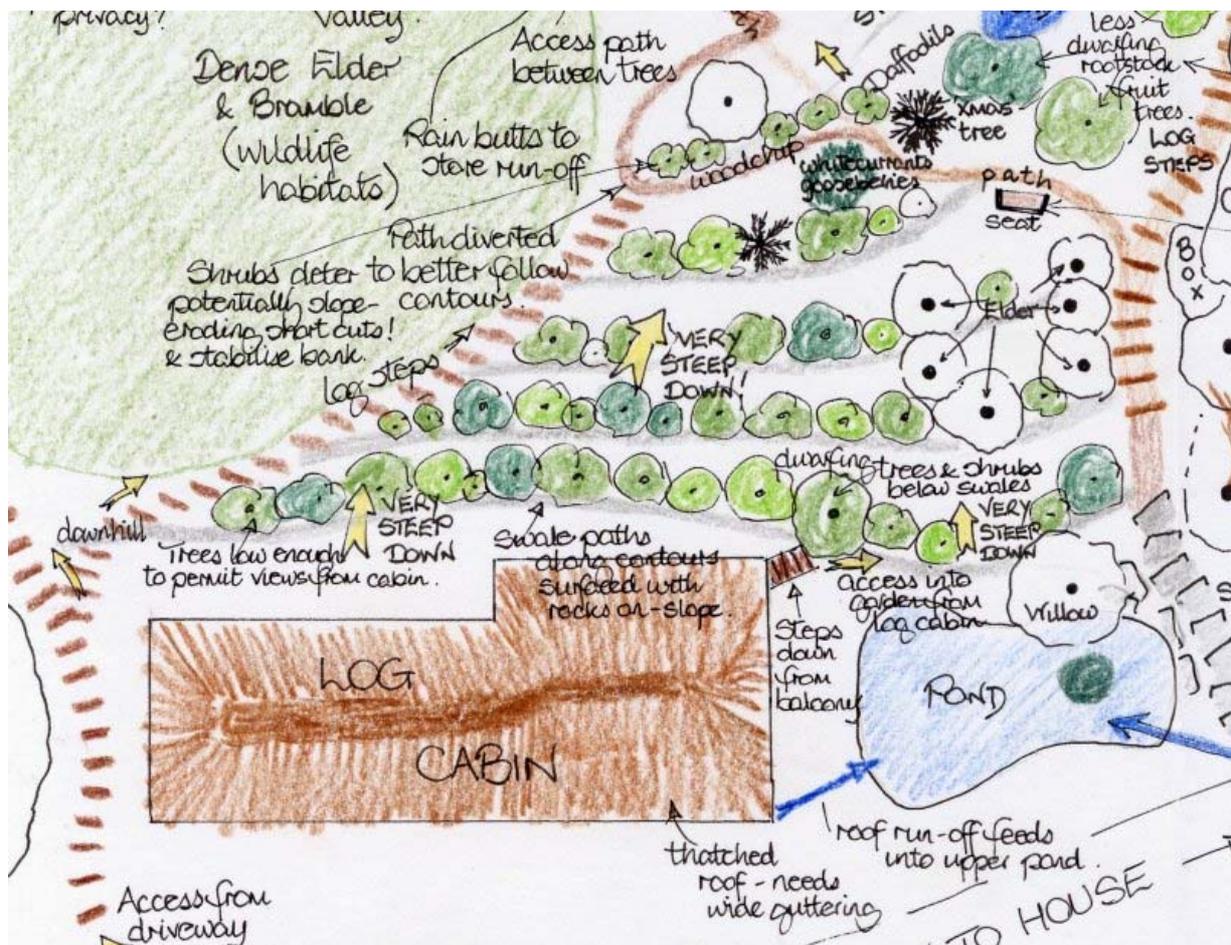
The treebog also provides lovely views across the valley to those who wish to loiter (maybe this isn't such a good idea!). I have diverted the path just above the treebog where it used to go down a steep & dangerous slope & made it follow the contours much more. I have also planted shrubs along the pathway at this point to deter slope-eroding short cuts. The raspberries here are obviously very successful & so I am leaving them all where they are, at least for now. They may in time benefit from any fertility that gets past the Willow planted around the treebog. The White Birch planted below the treebog will not be too dense to block out views, but will add a little extra shelter from the north wind. I thought that it would also be a nice tree around which to diverge the paths. The majority of the Elder & Bramble stays as wildlife habitat & for slope stability. The edges of the thicket could provide protection for native tree saplings planted there, which would in time improve the stability of the slope further.

The potentially quietest place on the site has to be this north west corner. I am building a little meditation hut underneath the Ash tree, using salvaged timber from the storage sheds up the hill. This could be easily delivered to the site when the bluebells weren't out by simply throwing them down the slope from the west side of the log cabin. The roof is thatched as Steve is skilled at doing this & has already roofed the log cabin in this manner. Willow wands planted in the marshy ground at the bottom of the slope narrows the path through to the hut & provides biomass & material for crafts & building. I have created a living Willow tunnel here too to give the feeling of entering a different space through a gateway.



The raspberries on the other side of the tunnel may not be sufficient to create a high enough boundary there & this may need to be reinforced to make the space more enclosed without cutting out too much light. Log steps down the side of the slope between the thicket & the line of trees provides an extra sheltered access from above.

In order to stabilise the upper slopes below the log cabin & restore productivity to them I am first creating a series of contour-following paths which will double as swales. By planting trees, shrubs & companion plants on the downslope side of the swales, the water & nutrients that they collect will be taken up & the root systems of the trees will hold the slope together. There is plenty of stone on the slope, so this will make an ideal surface for the path, allowing the water to penetrate, but the surface to stay firm for walking upon.



The trees will be chosen to not grow high enough to block the cabin views at maturity, but as the slope is fairly steep, only the uppermost trees will have to be on dwarfing rootstock.

The trees slightly to the side would provide wind protection if chosen to be higher than the cabin, thus providing a 'window' through the trees for the view. A set of log steps up the side of the Elder thicket links the swales together on the north side & also joins the treebog with the path from the top driveway, giving plenty of options for routes to walk.

In order to provide access from the log cabin to this enticing space, I simply need to build some steps from the balcony down onto the uppermost path/swale. Then people in the cabin could easily have access to the new facilities there, including the treebog & camping area (the log cabin is intended as a venue for running courses in). The run-off from the log cabin roof should be directed into the upper pond where it can be stored. From here any excess could be diverted down to the lower pond via a pipe & used to generate electricity on the way using a Pelton wheel. The electricity generated could be used to light the log cabin, treebog or meditation hut if required.

Implementation

As this is a design that was never implemented at all (I was busy with Hooke Court School, which could have been a paying job & then I moved on), my proposed schedule of implementation is all I have for this section. The trees would need to be planted in the winter months & as this design was put together during the spring, I have put the tree planting further down the list, though my preference would have been to cut the swales & plant the trees first.

Schedule:

1. Divert paths where necessary & dig in new steps (while ground still moist in Spring).
2. Plant Willow wands, Alder & Sea Buckthorn, make Willow tunnel (Spring).
3. Plant up pond (Spring).
4. Plant out raised beds (squashes?) (Late Spring).
5. Build the treebog, plant the Comfrey, plumb in rain butts (Spring/Summer).

6. Put in new seats at viewpoints (Summer).
7. Cut new access through hedge from lawn & improve existing access from lawn (Summer).
8. Cut swales across the contours of the upper slopes & surface with stones (Late Autumn).
9. Plant trees, shrubs & companions along the downslope sides of the swales (Winter).
10. Plant fruit trees & shrubs around campsite after observing best arrangement (Winter).
11. Plant new fruit trees & shrubs on lower slopes (Winter).
12. Make steps from log cabin balcony & put up guttering, diverting water to upper pond (next Spring).
13. Build meditation hut (next Spring).
14. Put in new steps down Bluebell walk (next Spring).
15. Any remaining miscellaneous jobs, then...
16. Install Pelton wheel?

Design Review

What went well

The **design process** itself I remember going pretty well, without many of the complications of the School design.

Information resources: I learned a bit more about plants along the way & found out how useful some of my available resources were in tracking down the information I needed. The Plants for a Future database was particularly helpful & I did a bit more background reading on elements such as swales & treebogs, which left me much more informed about them than when I started.

Client interview: Sue was very keen to have a Permaculture design on the land & was very clear about what she wanted from the site. It was also handy to be able to make any additional queries that I might subsequently have quickly & easily.

Drawing board: Getting a free technical drawing board a couple of days after asking the universe for one please!

What was challenging

Living conditions: The most challenging thing of all was trying to live & work in a tiny shed at Holmbush. Sue & Steve were kind enough to give me somewhere to stay at a difficult time for me, but it was a period of instability that went on far too long.

Hooke Court School design: I was doing this design for free, but also needing to earn some money somehow. Then the School design came along & it was the opportunity for me to do just that while doing something that I really enjoyed. As you have seen no doubt from the School design pages, this involved a lot of work for me & this design got relegated to second priority.

What I would do differently

It's been a few years now since I did this design & I can see potential problems with one or two of the aspects of the design.

Camping: While there was only one obvious flat area to be used on the site, I may have needed to design in a bit more drainage for the camping area; maybe a horseshoe drain. I could also foresee problems with midges in tents maybe... I needed more time there to do this sort of observation. I wasn't there long enough to see it right through the seasons & this kind of information could have helped me avoid such potential mistakes.

Reedmace: I have since learned quite how invasive this plant is & perhaps placing it in such a relatively small pond was a little optimistic.

Shade: The east end of the lower slope is particularly shaded by the existing line of trees; planting dwarfing fruit trees to the north of this was perhaps optimistic too, not just from the lack of sunlight, but from the damp air likely to linger there.

Frost: I suspect that I would have done well to have left a gap in the hedge for descending cold winter air to escape & not create a frost pocket at the bottom of the slope.