



Wyld Edges CIC Report

PFAF Food Forest Fund

October 2021 to Jan 2024

Company No 12074219

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Introduction

The Harmony Garden is a small patch of land hidden amongst rows of houses and flats. It is located in Cheshunt, Hertfordshire, 20 miles outside North London. One large majestic sycamore tree towers over the garden to the south west, with two 4 metre high, elders nestled in the corner to the south east of the garden.

The garden is facilitated by Wenderlynn and Iain Bagnall of Wyld Edges CIC, a small social enterprise offering permaculture education and regenerative practice for gardening and personal resilience. Using our previous knowledge of running a 5 acre permaculture LAND site in Mid Devon between 2011 and 2020, we are working with the local community to implement a food forest in the cheshunt, urban community garden.

Having left Devon in Sept 2020 due to unfortunate circumstance, we returned to Hertfordshire and started working with a local housing association and connecting with the local community. Food forests are more than growing food, they offer resources for medicine, crafts and for healing soil, bringing us back to our roots with the earth. We took this philosophy, our skills & expertise as permaculture designers & educators, and collaborated with the local community to provide a space for connection and education.

We were offered the land, for lease in Sept 2021, by B3 Living housing association. It had been used to dump sofas, chairs, garden waste, refuse and recycled and other residential and non residential waste. It was overgrown with brambles and nettles, and needed some serious TLC. It was also home to a family of foxes. Once we had enough volunteers, and with careful consideration of the foxes, we started clearing the area in Oct 2021, retrieving approximately 10 tons of waste.

October 2021 to October 2022

Using our expertise and experience as permaculture designers we went through a process of applying, Active Observation, clearing the brash and waste. The soil and insect life was diverse, with worms, centipedes, woodlice, as well as lady birds and lacewings. A variety of birds were already present, such as robins, black birds, blue tits and red kites.

Using permaculture design, these existing elements helped us shape the design of the garden. B3 Living offered support with seed funding of nearly £3000 for a shed, compost & basic resources, and donated second hand tools. Their contractors, Chigwell, donated the erection of a fence to help prevent any further dumping of waste. Although it felt wrong to do this, it gives the garden the secure, womb like feeling it has now, creating microclimates and offering some protection from the strong winds and frost. It has helped to give the comfortable and secure feeling, described by visitors.

Due to the amount of waste discovered, including plastic bags and glass, we felt the need to have the soil tested for contamination. B3 agreed to fund the additional costs for 5 tests areas.

One of the worst waste products we found was polystyrene. Polystyrene contamination can affect soil life, killing worms. We attempted to clear this from the soil, by digging out the soil and polystyrene together. Unfortunately this had broken into particles to the extent that it was impossible to clear it completely. We accepted we would not be able to grow food in this area at any time, and so ceased clearing the waste and soil, leaving the remaining particles in the soil.

We needed an area for structural elements of the design, so creatively responded to this limitation and used the area to place a green house and work bench, later it will include a compost toilet. In order to prevent the polystyrene particles spreading, the area was partitioned off with a wooden barrier, at ground level and willow, to prevent any further contaminate of nearby food growing areas.

Test Results -

In March 2022 test pits were dug. The results for each test were higher for heavy metal levels than is allowed in a community garden, but more importantly they were classified as excessive for lead and zinc. The minimum safety level is 200mg for a community garden. The results varied across the site from 301mg to 258mg.

It was recommended by the soil test company, we remove 2 feet of soil from across the 20sq x 20sq metre site and dispose of the soil in the correct way. This would involve money, people and time to remove it from the garden, all of which we didn't have any, or much of. We were not happy to shift contaminated soil to another place on the earth. We felt this didn't meet the 1st ethic of permaculture, Earth Care, and aimed to prevent this happening.

As permaculture designers we knew that permaculture was about finding solutions and mimicking the natural patterns in nature. Using this philosophy we put our heads together and came up with the idea, that we must be able to use plants in some way to reduce the heavy metal levels.

After some extensive research we discovered a process called phytoremediation. This is when plants, called hyperaccumulators, are used to draw heavy metal contamination from the soil, such as lead, of which there are approximately 400+ species. Some of these are well known such as cabbage, beetroot, carrots, potatoes, garlic, amaranth, lucerne and golden rod.

Our research showed however that Sunflowers had been indicated as a key phytoremediator. A one month old sunflower has been known to draw up 95% of

nuclear waste contamination. Using our knowledge and the power of nature we ordered several packets of sunflowers seeds and proceeded to sow these in spring of 2022. The sunflower is the Harmony Garden logo, so we felt this was a good omen and would be fun for the gardening community to grow. The downside to all of this was that we couldn't grow food directly from the ground, at least not yet.

As growing food is an important part of the garden, to connect people with healthy food for mental health, we decided to grow food in planters until we could harvest directly from the ground. The aim here was to integrate growing perennials and annuals together. The group proceeded to source planters in skips and Freecycle, and making some from pallets.

Planter 1	Planter 2	Other Pots
Tomatoes	Wolf berry	Thyme
Rosemary	Perennial rye	Comfrey
Wood Sorrell	pinks	Currents
Rhubard	Oxalis triangularis	Potatoes
Cinnamon vine	Sorrell	Tomatoes
Fennel	Lemon balm	Broad beans
Dill	fennel	Chocolate mint
Yarrow	French beans	Garlic
Mange Tout	Mange tout	Cucumbers
Cherokee beans	Amaranth (Hopi red)	
Other French beans	Amaranth (grain)	
Nasturtiums	Parsley	
Strawberries	Chard	
Nine Star Perennial Broccoli		
Tree spinach		

Growing Sunflowers and Building Soil -

Prior to planting the sunflowers we prepared the first set of beds, clearing as much waste as we could, digging it over several times in order to clear the glass, metal, plastic and other waste. We wanted to use the no dig method, so as not to disturb the soil life, including any mycelium that may be present. However it was necessary to do this in order to ensure plant roots would not be contaminated, and people would not hurt themselves on glass or metal found in the soil.

In order to repair the soil and build nutrients, we sheet mulched the areas with cardboard, old compost provided, by a local resident, straw and dead sticks. This was watered in thoroughly.

We later sowed with green manure of mustard greens, phacelia, red and white clover, rye grass, buckwheat and lucerne. The green manure would not only add nutrients back

into the soil but would also feed the sunflowers giving them the best start, helping them to extract as much of the heavy metal contamination as possible.

One of the limitations of the design of the garden is foxes. They dig for worms in the soil and like to play on the beds. In order to ensure they didn't disturb the sheet mulched layers, and green manure, we had to place bamboo canes in the ground and across the beds, and edge them with rubble we found around the site. This reduced their ability to dig and spread the straw and green manure everywhere. This seemed to work really well. We estimated we have sown over a hundred sunflowers seeds, with some of them being taken home by volunteers to bring on.

October 2022 - October 2023

In October 22 we used existing B3 funding to have the 2nd of our own tests done on test area TP1. This showed the lead levels had dropped from 301mg to 250mg and that remediation had taken place using sunflowers.

Using the permaculture principle, Designing From Patterns to Details, we duplicated the same methods in April 2023 creating the second set of beds, (The Elder Beds.) However this time, with funding from Pfaf, we planted perennials before adding the sunflowers. We wanted to see if the process would work the same way, using the remediation process at the same time as establishing the food forest.

In October 2023, with funding from the local council, we did a 2nd test on TP1 in the Sycamore Bed, and the first test in the new, Elder bed area, TP4

Both tests came back as the levels having dropped again. In fact in the Elder beds, the levels had dropped in TP4, [322mg to 252mg], considerably more than in the first test in TP1, which now showed a reduction from 250mg to 220mg. This may have been because no tests had been done since the original, in March 22. None the less this was very exciting and gave cause for extensive celebration. The hard work had paid off!

Planting a Food Forest -

Elder Beds -

The newly planted food forest has progressed well in the Elder beds, with additional perennials now being planted in the Sycamore bed too, extending the food forest system across the garden.

We have begun by planting two trees which should be reliable and familiar to everyone: a family apple tree (Christmas Pippin/James Grieve/Discovery), chosen to provide fruit for as long a period as possible - from August through to January, and a Jubilee plum tree, which is notably cold-hardy, something we were especially aware of following the

extreme cold spell we experienced in December 2022. There didn't appear to be any losses due to the cold spell.

We created guilds as the tables below show. Although we cannot harvest food from the Elder beds yet, production is going well and we are using the plants for other functions instead, such as rhubarb for mordant and dyeing, and soapwort for its saponins, to be used for educational purposes - we have already led a brief workshop demonstrating hair washing using soapwort. The herbaceous layer has been heavily planted as we have been able, with system plants such as lungwort, feverfew, lemon balm, iceplant, mints and marjoram. Tree cabbages have so far survived the cold.

The gooseberries have suffered from what appears to be sawfly, even at this early stage of the design. We included some annuals in the design such as flowers which are either edible or mainly for attracting pollinators and other beneficial insects. These include yarrow, borage, tagetes, pinks, gazinia, calendula and cosmos. They also provide colour for wellbeing, and marking out the edges of the Food Forest areas.

In the shadiest part of the garden, located North/North West facing, where the elder trees are, has limited planting opportunities. We have responded to this limitation by deciding this is where we will grow plants which prefer shade and are useful in other ways such as pokeweed for dying, and lungwort [which does extremely well here], for pollination, and as a medicinal plant, and hosta. Pokeweed and hosta may also be used for harvesting shoots as an asparagus substitute.

Sycamore Beds -

We additionally made the decision to design the original remediation test area as part of the Food Forest, minus a conventional canopy layer. This is to be a demonstration particularly on how a small garden or allotment can be planted, where planting trees is not an option.

Here we have planted red and blackcurrants, saskatoon, under-planting with the likes of daylilies, swamp milkweed and Turkish rhubarb. This bed is directly under the large sycamore tree. The south end of this bed has been difficult to get plants established. Assumptions are the sycamore canopy is reducing moisture to this area as well as the roots sucking up nutrients. Green manures haven't taken at one end, even though they were sown at the same rate.

In order to encourage growth, a bottomless compost bin has been directly placed with the aim of providing nutrients directly to the soil. An alder whip has been planted here too, to hopefully increase fertility. This is also the area where the very first test was taken.

We have also planted cinnamon vine in various areas of these beds but although they did put some leafy growth on, they did not fruit. This may have been due to the extreme heat and lack of water.

We are trying Hablitzia for the first time, these are shooting now. Some plants, such as campanula, (used as ground cover & for edibility), and fuchsia were taken or dug up by the foxes.

Elder Bed Guilds-

Guild	
Sub canopy	Family apple tree
Shrub layer	Lavender (for bees, scent and edibility)
	Raspberry x 2 (red and yellow)
	Broom (for nitrogen fixing)
	Rosemary
Herbaceous	Globe artichoke
	Sedum (ice plant)
	Chocolate mint
	Lupin (nitrogen fixer)
	Hollyhock
Ground cover	Alpine and other strawberry
	Pinks
	Scabious
	Borage
	Tagetes

Guild	
Sub canopy layer	Plum Tree
Shrub layer	Red Gooseberry
	White gooseberry
Herbaceous	Yarrow
Ground cover	Alpine and other strawberry
	Gazinia
	Feverfew
	Majoram
	Primrose
	Lemon balm (mineral accumulator)
	Chocolate mint
Perennial Vegetable	Asturian tree cabbage
Vegetable	Milk Thistle

Guild	
Shrub layer	Jostaberry
Herbaceous	Rhubard
	Lemon balm (as a mineral accumulator)
	Feverfew
	Sorrell
Ground cover	Alpine and other strawberry
	Gazinia
	Feverfew
	Borage
	Milk Thistle
	Gaultheria Procumbens

Guild (very shady area)	
Canopy	Elder trees
Shrub layer	Buddleia
	Elaeagnus (nitrogen fixing)
Herbaceous	Pokeweed
	Golden Rod (hyperaccumulator)
	Golden rod
	Sorrell
	Comfrey (mineral accumulator)
Ground cover	Feverfew
	Borage (for nitrogen fixing)
	Lungwort
Vegetable	Milk Thistle

Sycamore Beds Guilds -

Guild	
Shrub layer	Saskatoon
	Blackcurrant
	Redcurrant
	Broom (nitrogen fixer)
Herbaceous	Red sedum
	Soapwort
Herb	Welsh onions
	German garlic

Ground Cover	Lungwort
	Borage
Vertical layer	Cinnamon Vine
Annual	Dill
Bulbs	Tulip (for edible petals)

Guild	
Shrub layer	Alder whip(nitrogen fixer)
Ground cover	Ajuga
	Calendula
	Feverfew
	Alpine strawberry
	Yarrow

Guild	
Herbaceous/shrub	Swamp milkweed
	Day lilies
	Alexanders
	Fennel
Veg	Milk Thistle
	Purple kale
Vertical	Hablitzia
Flowers	Echinacea

Guild	(currently unproductive area)
Shrub	2nd Alder whip
Herbaceous	Turkish rhubarb
	Fuchsia
Grain	Perennial rye
Vertical	Cinnamon vine
Ground cover	Strawberry
Vegetable	Chard

Production and Maintenance -

The green manures did well as a chop and drop. However the clover became too high maintenance within the growing beds, making it difficult to maintain unwanted weeds and reducing light and nutrients to other plants. We have decided to remove it and encourage other more manageable green manures such as phacelia or vetches, and ground covers such as strawberries and periwinkle, sedum, and mints, and ajuga, chop 'n' dropping the mint, if it become too abundant for the area. We removed as much of the clover as we could, replanting it in the lawn. All trees and shrubs have been inoculated using beneficial mycelium upon planting

In the newest area of the Food Forest, we created pathways with landscape bark, which invite integration directly through the beds, amongst the trees and shrubs. The bark will define the path but also, keep it moist as well as permeating fertility into the surrounding edges. Later it can be used to add to the beds as it breaks down, and new bark or woodchip to replace it. It will also help to keep weeds down in the path, keeping it relatively low maintenance. It also looks attractive. We were reminded of how the same technique had been applied, when on one of our visits to Tapely Park, Food Forest garden in Devon, some years ago.

We have continued to focus on phytoremediation, with continued mass plantings of sunflowers but additionally, we have been delighted by the amount of self-seeding that has taken place, with dozens of sunflowers popping up, along with other plants such as calendula and borage.

Our aim has been to remediate the soil in the Sycamore bed ready for planting and harvesting from the ground by the summer of 2024. The hot weather of 2023 and lack of water on site, meant the sunflowers didn't put on as much growth as we hoped. As a result we are 20mg short of reaching the necessary 200 mg, acceptable level. However we decided as a gardening community, that we felt confident enough to go ahead this year and harvest from any produce we grow here.

In using the principle of stacking functions, willow is a phytoremediator and has been planted on the edge, between the Sycamore bed and the contaminated polystyrene area. It will be used for small harvests of firewood, artists charcoal, and an art installation but its main purpose is to act as a barrier, stopping any contaminated soil working its way into the growing bed.

Once the sunflowers started to die we removed the complete plant and burned them, rather than adding them to the general compost. This was so any lead present was not returned to the soil. However this proved not to an efficient way to remove the contaminated material. We have since removed the plants and stored them in compost bags ready for processing as contaminated waste. We have yet to find a company who will process them locally.

Water as a Limiting Factor –

A lack of water in the first year, and even after some water collection had been established in the 2nd year, meant the garden wasn't able to be watered properly. It was not sustainable to use the neighbours hose as a water source. This was due to the limiting factor of people having to be at the garden more frequently than they could, and the accessibility of the neighbours hose. It was a very labour intensive process collecting water in this way to fill the waterbutts. As an energy, inputs and outputs analysis, the inputs were high compared to the yields gained.

One volunteer carried water downstairs, in buckets, from their flat in order to keep the waterbutts filled. In regards to relative location, this was a lot of work and energy intensive too. However even this challenge meant we could at least give some moisture to the garden. Unfortunately the planters did dry out on several occasions, with some plants eventually dying. These proved to be not work as well as we had hoped. A triage system had to be applied to watering, making the perennials in the ground more important, with everything else doing well.

The challenge to keep the garden watered did highlight a strength of the gardening community and the potential longevity of the garden. It showed how much people would pull together when there were extreme challenges. This has been the heart of the community ever since.

Most of the plants have survived since first planting, even though, the lack of water meant blossom and fruit growth was minimal. Factors that could have supported this result are the sheet mulching, with cardboard and straw, which helps to retain moisture and keep soil and plant roots cool. The introduction of green manures, which will not only have kept the sunflowers fed, will also have provided nutrients to the rest of the garden too.

The trees and shrubs will now have had another year of root grow which should make them stronger. From a soil analysis, the soil appears to be a clay loam and very stoney, making it well drained. However it can become compacted and hard in the summer if there is not enough moisture.

The planting of sunflowers in amongst the food forest, could have also been a factor in the reduced fruit production and water retention, however this is a fledgling food forest system so the results do not fully reflect the full potential of the system. Going forward the sunflowers will not play such a significant part in the future of the garden.

Two IBCs have now been sourced, which we hope, along with the 4 x 210ltr waterbutts, will sustain the garden for water in the long term. This year [2024], and into the spring of 2025, will determine if this is sufficient enough to provide the necessary amount of water required.

Additional Yields

As the Harmony Garden is a LAND (Learning And Newtork Demonstration), learner site through the Permaculture Association UK, planting the food forest before waiting till the garden has been fully remediated; has meant we have been able to still demonstrate where we are applying permaculture techniques.

It has also provided a source of learning for the volunteers, showing them how to place plants in relation to sectors and guilds, and helping them to identify what plants are, by when planting them. This has extended into applying some of these techniques in their own gardens.

Annuals such as broad beans and tomatoes have been planted to demonstrate integrating annuals into a perennial based system, the broad beans also provide additional nitrogen. Familiarity with these has helped to engage volunteers with the perennial based system.

Apples and plums are known to everyone so we included these as a baseline for trees and shrubs. We felt these would engage people initially. We mixed this up with more unusual species such as jostaberry, swamp milkweed and saskatoon. These were not just chosen for being unusual, but also, for example, their ability to withstand temperatures down to -20c.

As yet we have not recorded much in the way of insect life. However there was an abundance of several types of bees, harlequin and native ladybirds, a variety of butterflies and moths including jersey tiger, comma and red admiral. We cannot be sure however, this is due to the newly planted food forest. More indepth monitoring will tell if there is an increase in biodiversity.

Mental health support is a key social element of the provision of the garden. As the food forest progresses, there will be an opportunity for volunteers to gain deeper knowledge and skills on how to use it for wellbeing.

Evaluation and Next Steps

Until we are happy that remediation is no longer necessary, the garden will continue to be heavily interplanted with sunflowers, in addition to amaranth and golden rod, both of which are phytoremediators.

Although these plants will compete with the perennial plants for nutrients, water etc, it is essential to reduce the lead levels, and we are confident that we can offset a significant amount of this negative effect, with the use of green manures. Over time the green manures may selfseed and there won't be the need to sow them. However as other more permanent nitrogen fixers are planted such as, broom, alder and bladda senna as well as comfrey, the green manures will be replaced with these as system plants for fertility building.

We will continue with the remediation process but not take any soil tests until Spring 2025. Based on the results we have achieved over the last two years, we trust the sunflowers will continue to do their job, although we intend to plant less of them in the Sycamore bed as we wish to increase production of crops, both annual and perennial. Planting too many sunflowers here now may make it difficult to maintain these crops.

We will add more nitrogen-fixing plants and build soil health, through the further application of beneficial mycelium. Additional perennials will be integrated, as we continue to research the best plants for the garden based on climate change and needs of the community.

More research is needed on our microbial remediation compost pile, and as yet have not come up with anything definitive on how we can achieve this. We haven't yet had a chance to progress with mycoremediation.

It is suggested biochar can help in bioremediation. This is something we may consider doing in the future, simply for experimental and educational purposes.

We feel we will now have a better understanding of how the food forest will progress this year [2024] and into the Summer of 2025. We aim to be able to fully harvest from all areas of the garden by summer of 2025, by which time we hope to be able to give a clearer picture of the production of the garden, and the food forest system.

Celebrating and Limitations

The community has worked with several limitations during the last couple of years to achieve these results. A lack of water, and needing to wheel barrow it into the garden from a neighbours hose, extreme heat and the loss of several plants from foxes and heat, and mice eating the sunflower seedlings, as did slugs and snails. Pigeons became a new addition for 2023. However these are prey for red kites and the foxes.

As a community we continue to build on the success of the garden through celebration of the seasons and each other, and the yields the garden provides.

Note:

This research and report information is not exhaustive.