

One Planet Development Management Plan



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Tir y tylwyth teg

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Contents

- 1 Summary
- 2 Base line
- 3 Design/strategy
- 4 Business and improvement plan
- 5 Land management
- 6 Energy and water
- 7 Waste assimilation
- 8 Zero carbon buildings
- 9 Community impact assessment
- 10 Transport assessment plan
- 11 Ecological footprint analysis
- 12 Transition
- 13 Phasing of proposals
- 14 Monitoring
- 15 Exit strategy

Introduction

I have spent nearly all my life working within the natural environment, providing for my needs from both grown and naturally reproducing natural resources keeping myself grounded and earthed is important whilst being aware of the environment that I live and work within. For myself the rewards have always been about much more than just earning money, fundamentally I have thrived not only being within, but being part of nature.

For 34 years I was a fisherman, running my own small scale inshore fishing vessel, fishing sustainable around the Pembrokeshire coast, I was blessed to spend my days amongst Dolphins, Porpoises, Seals and the many different types of sea birds which inhabit our coastline, as I fished for and caught crustaceans, molluscs and fin fish which were sold to local retail customers and wholesale markets, my marketing plans have always been built around selling myself and my ideology as well as my produce, I feel it's important for customers to buy in to my ethos not only the product which I am selling.

Throughout my time as a fisherman I noticed the changes being brought about by climate change and the affects that it was having on ocean currents, and how industry encroaches on the natural world. I became concerned with the changes to migration, breeding and feeding patterns amongst nearly all species both in and on the sea which I was witnessing, fishing patterns changed dramatically over the period whilst I was fishing. Climate change is having a dramatic effect on the world we live in. I believe that each and every one of us need to take responsibility for our personal ecological impact, the earth's resources need to provide not only for this generation but also future generation.

I made the decision early 2011 to look closely at what changes I could make to reduce my personal impact and ecological footprint. I quickly came to the realisation that even here in Pembrokeshire there were quite a few individuals who had altered their life styles to reduce their personal impact on the earth and being more conscious of how they are meeting their personal needs and were living a simple life, and their numbers are growing !

My one planet journey had begun. Firstly I began to cycle rather than drive whenever I could, reducing my yearly mileage considerably. I focussed on my energy needs and began prioritising, becoming more conscious of the distance my food was traveling and how it was grown prior to myself purchasing and eating, the packaging it came in and how I disposed of my waste, reducing my footprint on the planet.

Having now reduced my impact as far as reasonably possible, the natural progression was to purchase land for my sole residence, provide for my needs and create a land based business with a light touch on the environment, positively enhancing the environment where ever possible through my activities on the site, where I could provide for my own needs, growing food, planting trees, increasing bio-diversity, generating my own electricity, harvesting rainwater and reducing my own ecological footprint to a sustainable limit which reflects that we only have "One Planet"

<http://stevesopdjourney.blogspot.com/>

https://www.facebook.com/Tir-y-tylwyth-teg-106193987794141/?modal=admin_todo_tour

1. Summary

The development includes:

- One timber cabin (caravan) 10m x 4.7m
- One workshop (4.2m x 2.4m)
- One Wind turbine
- One compost Shelter (2.7m x 2.7m)
- Solar panels and frame (10m x 2.5m)
- One chicken coop (5m x 2m)
- Field Shelter (4 x 3m)
- Six polytunnels (7.3m x 2.46m each)
- One compost toilet (3m x 2m)
- Reedbed (20sqm)
- Pond (3sqm)
- multiple rainwater harvesting tanks

and associated landscaping

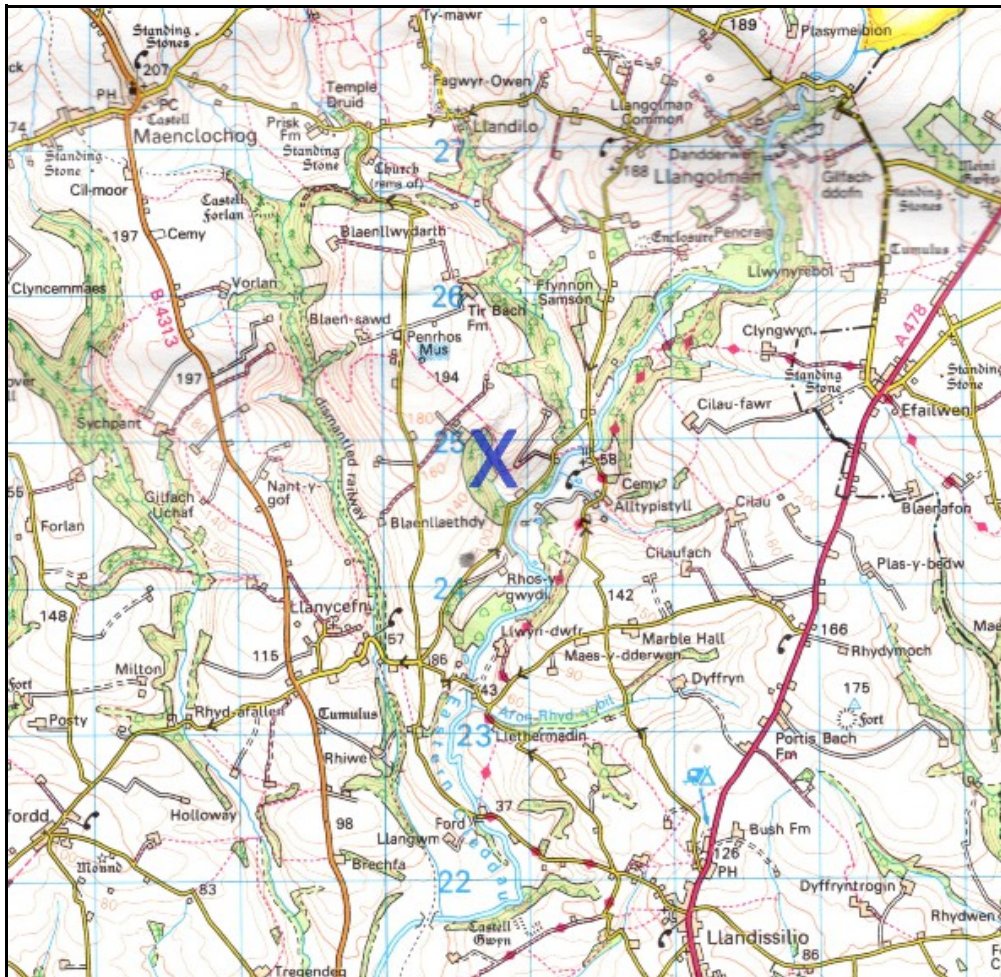
The cabin will be my sole residence.

This management plan has been prepared to set out my clear objective to provide for my needs and create a land-based business and live a low impact lifestyle.

2. Baseline

2.1 Location and Description

The plot is situated approximately 2 miles southeast of Maenclochog and approximately 1 mile northeast of Llanycefn.



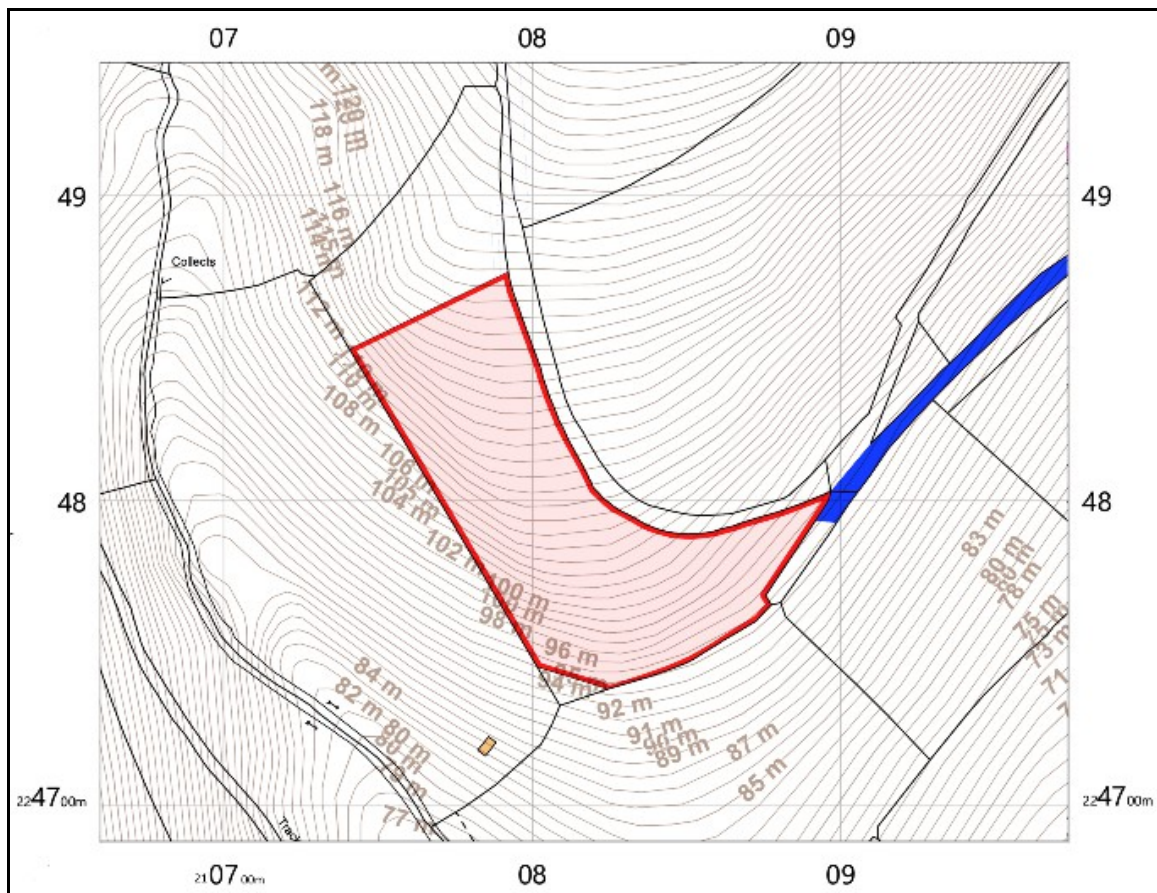
The plot comprises 0.809 hectares (2 acres) of land. The land is classed as improved pasture.¹ It has been assigned grade 4 under the Agricultural Land Classification Map (poor quality agricultural land)

The site is sloping towards the south/ southwest, ranging from 125 meters above sea level at the northeast corner to 95 meters above sea level in the southwest corner.

The 2 acre site is part of a 2.7 acre field and has mature hedges on the eastern and southern boundaries the western boundary is a wire fence bordering a

¹(CCW. Phase 1 survey 1993).

community woods (NANT-Y-CWM COMMUNITY GROUP LTD) The northern boundary is currently a wire fence, but will be replaced with a hedge with natural shrubs and trees.



2.2 Landscape

The land is not visible from any neighbouring properties, there are no views of the site from any roads. A mature coniferous woodland borders the plot to the west. The southern boundary is a mature hedgerow with standards. The eastern edge runs alongside a green lane bridleway, and the northern plot edge dissects the original field (with approximately half an acre of field above the plot).

The plot sits within a varied landscape that includes a forestry plantation to the west, a dairy farm to the north, a One Plant Development to the east along with multiple smallholdings to the south.



The Landmap survey (Visual and Sensory) describes the area as:

The New Inn Aspect Area, covering several geographically close areas of land contains an upland agricultural landscape with scattered farmsteads throughout... Mature trees in overgrown hedges and woodland belts often associated with small valleys include a strong presence of conifer plantations which add to the upland association of the landscape... Borrowed views of Preseli Hills add to this upland sense of place...

2.3 Buildings and services

There are no existing buildings, structures or mains services on the site.

2.4 Tenure and Access

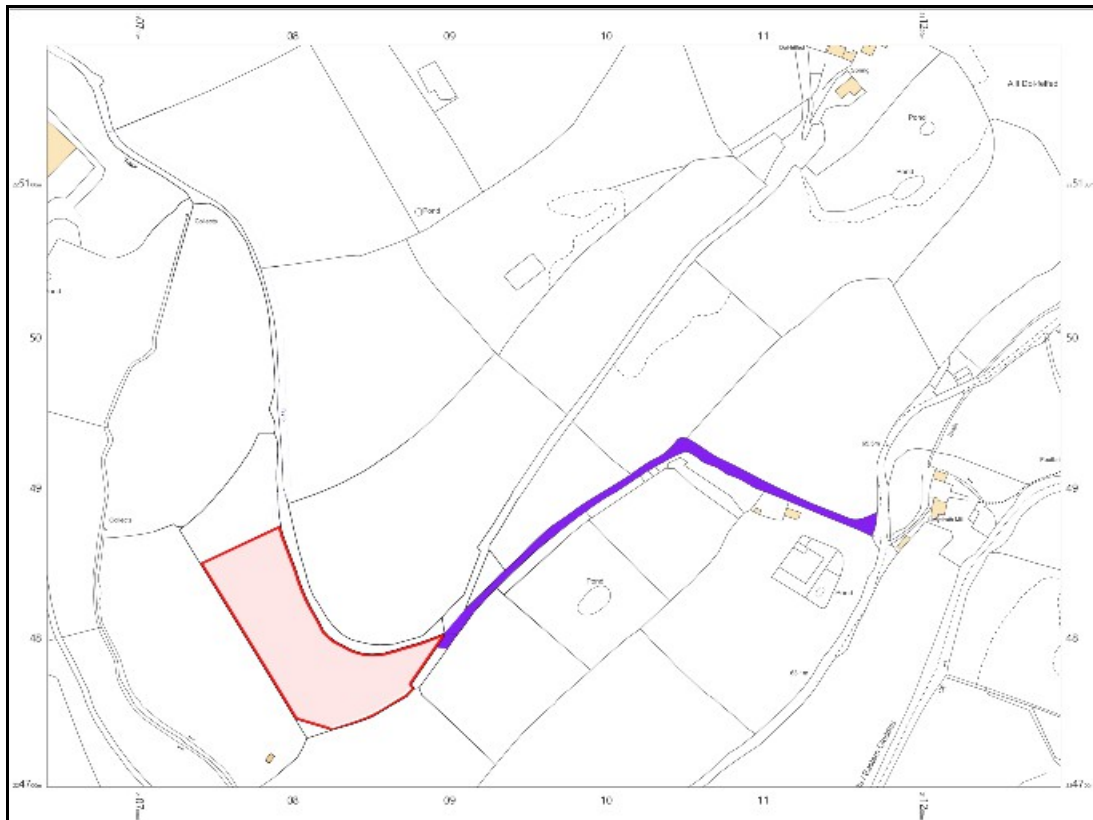
I own the freehold.

The site is accessed along a track running from the council road east of Llanycefn. I do also have legal rights of access from the north, though I do not expect to use this (*not shown on the plans*)

2.5 Unilateral Undertaking/agreement/Draft S10

Once my planning application has been registered, I intend to submit a unilateral section 106 to accompany the application. I plan to offer the following covenants², subject to the planning officers approval:

- *That the Dwelling shall at all times be the sole residence of the person(s) in Occupation of the Dwelling.*
- *That the ownership of the Dwelling shall at all times be in the same ownership as the Land.*
- *That the Land shall only be Occupied and used by the person(s) in Occupation of the Dwelling.*



² This wording has been copied from a unilateral 106 from an approved OPD in Pembrokeshire; Bryn yr Blodau

2.6 History and Cultural Heritage

Prior to purchase the land had been owned by the same owner for the previous 9 years, over which time it has not been ploughed and has only been used for grazing cattle. The land was originally part of a 20 acre parcel before being separated in to smaller parcels to be sold, and over the past 2 decades has had two owners and before that it was owned by the church council.

Whilst there are no sites of cultural or archaeological note on the site, there are many ancient standing stones in the area, and the locality has a long and interesting cultural heritage. There is a small museum close by, Penrhos cottage, reputed to be an example of a 'Ty Unos'.³

The Landmap survey (Historic Landscape) describes the area as:

Llangolman is a large historic landscape area lying across several parishes and encompassing the upper part of the valley of the Eastern Cleddau and its tributaries. The valley floors here lie at about 60m to 80m, but the valley sides rise steeply to over 130m before levelling out onto undulating ground between 130m and 200m. This area includes the valley bottom, the valley sides and the higher ground above. The valley sides are heavily cloaked in woodland - a mixture of semi-natural deciduous woods and 20th century coniferous plantations. The remainder of the area is enclosed into small, irregular fields. Boundaries are mostly earth banks topped with hedges, but stone and earth banks and stone-faced banks are also present. Hedges vary in condition. Most are well maintained, but some are overgrown and neglected with gaps appearing. In a few instances hedges have completely gone. Agricultural land-use is almost entirely improved with very little rougher grazing and arable land. Several small isolated deciduous woods, trees in overgrown hedgebanks and the dense woodland on the steep valley sides mentioned above lend a heavily wooded aspect to parts of this landscape, although on the higher ground trees are rare apart from those in hedges. The settlement pattern is dominated by dispersed farms, houses and cottages, with the hamlets at Llangolman and Rhydwylym providing the only foci. Farmhouses are predominantly 19th century, in the vernacular style, stone-built (cement rendered or bare stone), three bays, two storeys, with slate roofs. Houses and cottages in a similar style but of one and one-and-a-half storeys are also present as are examples of late 18th-century or early 19th-century houses in the polite Georgian tradition. It is likely that the cement rendering on some older houses and cottages masks earth (clom) cons

The Landmap survey (Cultural Landscape) describes the area as:

The lowland part of Pembrokeshire, characterised by rich farmland and small wooded areas, more bilingual in character than the lowland area to the south.

2.7 Existing transport generated

Currently I live 22 miles from the site in Pembrokedock , SA72 6EW with a round trip journey of 44 miles each day. Please see transport chapter for more details.

³<https://www.visitpembrokeshire.com/attraction-listing/penrhos-cottage>

2.8 Biodiversity

The Landmap survey (Landscape Habitat) describes the area as:

An area of predominately improved grassland comprising a considerable number of fields with associated field boundaries. Also present is some arable farming and very small areas of a number of other habitats

An ecological report has been carried out which goes in to this aspect in far more detail. It accompanies this management plan, within the introduction describes the land as :-

“The proposed site is part of a pasture field that has been improved for agriculture, near to the edge of the village of Llanycefn. Surrounding habitats include similar pastures, hedgerows, and woodland. The survey area included all of the development and adjacent boundary features”

2.9 Physical Geology (Soil)



Soil analysis was carried out indicating a slightly acid soil with a ph of 6.

3. Design/Strategy

3.1 My plan

My plan is a simple one, to follow in the footsteps of those who have gone before me. Purchasing land to be my sole residency establishing a land based business, having a light touch on the environment whilst also having a positive impact on the environment/eco system, living a one planet lifestyle in the open countryside to enable myself to live a low impact lifestyle and to provide for my minimum needs in terms of income, food, energy and waste assimilation whilst creating a full time land based employment for myself. The entire project is aimed at being minimalistic and aims to avoid over development in the countryside.

My aim is to initially achieve an ecological footprint of 2.44 global hectares (which is half of the national average) or less and demonstrate clear potential to move towards 1.88 global hectares within 5 years.

I have purchased 2 acres of land midway up a secluded valley. As I am currently single and it has been a conscious choice to purchase a relatively small plot as I will need to keep things manageable, one of my long term aims will be to lease extra land to increase my opportunity to graze animals. But for now I don't intend to keep large amounts of animals other than chickens, and possible sheep or two for manure which will need minimal land. I intend to improve the growing areas using compost, which will be created from biomass (and waste) which is grown and produced on the site (and supplemented by occasional deliveries of manure from local farms/stables), sections of my vegetable plot will periodically be set with green manure to restore the balance and improve the soil.

My land based business will be market garden/ horticulture, selling seedlings, flowers, fruit and vegetables which will be grown not only naturally but in harmony with nature, with no introduction of pesticides or non-natural fertilisers. Natural fertilisers will be encompassed within plant watering with a 1 – 2% mixture of water soaked in site grown comfrey/nettle/urine or seaweed solutions. Great care will be taken to insure that the site remains in sync with nature with mammals and birds being encouraged to live and feed allowing a balance to be struck between nature and my own personal needs, whilst enhancing bio-diversity. The aim will be to integrate nature within the site activities, encouraging a natural ecosystem to develop.

The use of Polytunnels will extend the growing season assisting the site to be more productive, (*Currently there is a planning application in for 2 Poly tunnels/1 field shelter/1 compost station to assist initial development on the site...Application 20/0089/PA*) this will be supplemented with an orchard, forest garden, vegetable plot and flower garden to provide for my immediate needs and for produce to sell to provide a small income, some crops will be grown in small quantities for my own use while others will be in larger quantities with the intention of selling.

My intention to use vegetable waste from the site mixed with rainwater harvest as a feeding system removes the need to use fertilisers, insuring compost/soil will remain rich in nutrients.

Compost will be generated from vegetable food waste, animal manures, green waste from growing food and timber along with specifically grown vegetation such as comfrey from the site.

My aim is to conserve and enhance the bio-diversity of the site using nature as a blue print indicating which areas will support which plants successfully.

3.2 Meeting my needs.

Food – With the exception of one or two specifics nearly all my food needs will be met by the site by year 5

Water – Rainwater harvest, from the rooftops will be split in to 2 separate systems, one for watering plants and the other for domestic usage which will be stored in a large water store which will be purified with the assistance of filtering systems for drinking.

Electric – I will generate electricity from both solar panels and a wind turbine; running a charge controller, deep cycle batteries and power inverter.

Cooking – For the vast part of the year electricity generated on site will provide the power for cooking using an electric hot plate. With sufficient sunlight and wind between February – November each year this would be feasible. Throughout the darker months, December – January, I will use home-grown willow biomass on a solid fuel stove (willow), supplemented with small amounts of LPG, at times when there is insufficient sunlight or wood to maintain adequate charge on my battery banks.

Heating – For the vast part of the year electricity generated on site will provide the power for heating using an electric oil filled 1000w radiator. With sufficient sunlight and wind between February – November each year this would be feasible. Throughout the darker months, December – January, I will use home-grown willow biomass on a solid fuel stove (willow).

Waste – I will compost all organic waste on site.

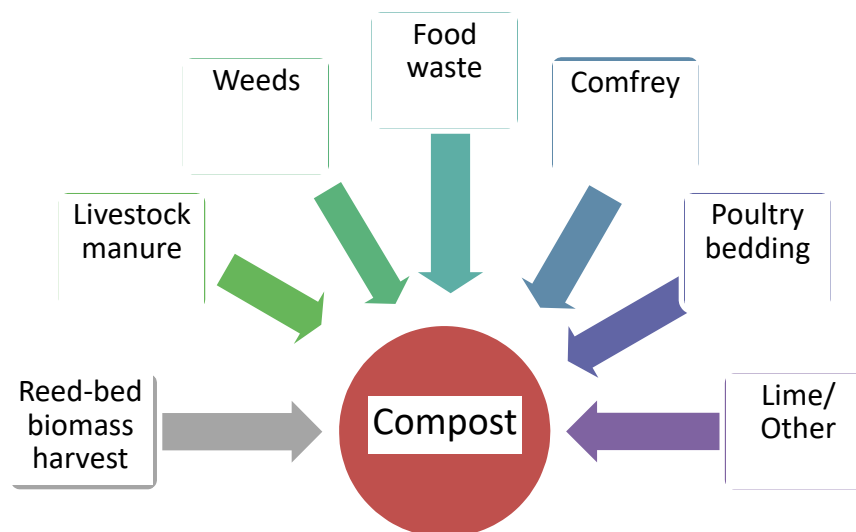
4. Business and Improvement plan

4.1 Land based activity

I am confident that within the 5 year period a very large proportion of my needs will be met from the site, I will create a large horticulture area plus a flower area, forest garden, blueberry area and coppice area. I will use poly tunnels to provide an intensive cropping environment. I will keep chickens to provide meat and manure, and rent land to sheep in exchange for a source of manure. I plan a degree of experimentation to explore the suitability of the site for growing apples and various nuts with the aim of expanding and developing these crops if they prove successful on the site. I also intend to develop an ornamental willow lobster pots basketry.

4.2 Compost

The manufacture of compost on the site will be fundamentally important not only to the re-cycling element but also to the success of the growing areas.



4.3 Site Table and overview

Aspect	Area	Products – home consumption	Products - Income	Other Benefits
Forest Garden	540m ²	Fruit, nuts, herbs		Wildlife
Chickens	920m ²	Eggs, table birds	Eggs, livestock	Manure and feathers
Polytunnels	108m ²		Fruit and Vegetables	
Vegetable Gardens	1200m ²	Fruit and Vegetables	Fruit and Vegetables	Wildlife
Flower Garden	160m ²		Flowers	Wildlife - pollination
Blueberries	330m ²		Berries	Wildlife
Grazing	1050m ²			Manure - compost
Willow Coppice	2350m ²		Craft	Fuel

To a large extent the land based business will be shaped by market forces, for this reason, and the figures herein should be treated as projections subject to variation.

The business strategy is a simple one and will be a market garden; two things can be taken for granted, people need to eat and so will buy food also people are becoming more conscious how and where there food is grown. I intend to build my business strategy and marketing plan around these two principles.

My main crops in the early years will be strawberries, vegetables and flowers; all will be marketed locally and on a weekly basis using farmers markets, car boots, honesty stalls and wholesale outlets.

Strawberries will be harvested mid-summer as will vegetables with flowers being harvested springtime.

By year 5 the blueberries will have come into production.

My forest garden provides space for growing nut and fruit crops as well as perennial food crops. The intention is for this area to provide for my household – however if there are aspects here that do very well – they will be scaled up and replicated in other areas of the plot.

I also plan to sell young plants and flowers.

I will also experiment with growing baby vegetables, different types of flower, and weaving willow ornamental lobster pots.

4.4 Forest Garden

The forest garden will contain mixed trees, bushes and ground plants to produce nuts, berries, fruits and perennial greens. It is situated in the middle of the plot, sheltered from the west by the conifer woodland (and coppice) and to the east by the bridleway hedgerows (which include mature standards). The area will be designed to not only being productive but to increase bio-diversity and provide a food supply for wildlife. The area extends to approximately 540 square meters.

Hierarchy	Crop	Use	Extent	Expected yield at year 5
Canopy	Common Walnut	Nuts	4 Trees	Yields not expected until after year 5
	Sweet Chestnut	Nuts and timber	8 trees	Yields not expected until after year 5
	(Native) Alder	Nitrogen fixer	5 trees	
	Scots Pine	Shelter and timber	20 trees to begin with – reduced over time	
Shrub - high	Hazel Nut	Nuts	5 trees	20kg
	Damson and Bullace	Fruit	4 trees	12kg
	Apple Tree	Fruit	8 Trees	40kg
	Cooking Apple Tree	Fruit	2 trees	10kg
	Asian Pear Tree	Fruit	5 trees	20kg
Shrub - low	Autumn Olive	Nitrogen fixer	10 trees	25kg

	Medlar	Fruit	2 trees	20kg
	Elder	Medicinal berries	5 trees	1kg
	Dogwood	Shelter and Mulch	multiple	
Upper ground	Blackcurrant	Berries	10 plants	50kg
	Redcurrants	Berries	10 plants	40kg
	Gooseberry	Berries	5 plants	20kg
	Raspberry	Berries	10 square meters	20kg
	Tayberry Bush	Berries	10 square meters	15kg
Lower ground	Rhubarb	Stems	10 plants	7kg
	Comfrey	Mulch		
	Mint	Ground cover/ Herb tea		
	Various herbs/ wildflowers	Pollination		

Management will be done by hand – mostly with scythe, loppers and secateurs.

The Forest Garden will supply me with fruit, nuts, herbs year round. Fruit will be dehydrated for preservation, and nuts will be stored for use throughout the year.

4.5 Chickens

I intend to initially have a flock of Black Rock chickens, which are a hybrid cross from selected strains of Rhode Island Red (cockerels) and Barred Plymouth Rock (hens). They are very popular amongst smallholders and organic farms since they are good foragers, have dense feathering to protect them from the elements and have a good strong immune system. Black Rocks will lay around 280 brown eggs in their first year and unlike some high production hybrids that lay more eggs in their first year, maintain good shell quality throughout their lives.

I will keep approximately twelve hens (and accompanying cockerels) to supply me with eggs and table birds. I will sell laying hens to cover additional feed costs, though I expect these to be low on account of the forage system that I will use.

The hens will be rotated between two runs, with each run being rested and planted in turn. The fox-proof enclosures will be planted up with the following forage:

Perennials (permanently established)	Annuals (sown when area is in rest)
Comfrey	Nasturtium
Fennel	Peas
Raspberries	Beans
Blackcurrants	Lupin
Mulberries	Chickweed
Siberian Pea Shrub	Buckwheat
Oregano	Clover
Plantain	
Dandelions	
Wild Garlic	

In addition to this, the hens will be fed any excess vegetables arising from both my home -produce and land-based enterprises.

I estimate that the hens will produce approximately 2640 eggs per year.⁴ Of this I reckon I will eat in the region of 468 eggs per year, and sell 362 boxes.

⁴Based on 220 eggs per year – allowing for a decrease in production rates as some birds sit

The hens will be allowed to sit on eggs from time to time so that I can raise birds for the table and for sale. I aim to raise approximately 75 birds in a year; 50 for my own consumption, and 25 for sale. The intention is to stagger these such that at any one point I have no more than 40 young birds in house. From time to time these will supply replacement hens.

Costs

Supplementary feed costs: layers and cocks (14 birds): estimated at 25kg per bird per year: 17.5 bags mixed poultry corn @ £7.15/bag⁵: £125

Supplementary feed costs: table birds⁶ and pullets⁷ estimated at 4kg per bird per year: 15 bags mixed poultry corn @ £7.15/bag: £107

Other supplementary minerals/ medicines: £40

Seed for annual sowings⁸: £15

Boxes and labels: £36

Total costs £323

4.6 Sales of eggs and pullets

25 pullets @ £11 each⁹ £275 turnover

362 boxes eggs @ £1.50ea. £532 turnover

4.7 Profit

By year 5 I expect this aspect of the holding to bring in an income of £484 per year, and I expect this aspect to provide me with 50 table birds (valued at £550) and 78 boxes eggs (valued at £117).

⁵Source – CCF Crymych, Oct 2019

⁶Ready at 8 weeks

⁷Ready at 19/20 weeks

⁸Note that some seed I will produce myself – Nasturtian, Peas, Beans and Lupin. I will buy in Buckwheat, Chickweed and Clover

⁹Price based on Tesco price free range chicken Oct 2019

4.8 Horticulture - Vegetable Gardens (self sufficiency)

An area of the vegetable garden (approx 150 square meters) will be used to supply myself with vegetables year-round. I have a very simple and regular diet and am confident that I can supply myself with all my vegetables. I aim to eat what I can grow through the seasons where food can be kept fresh on the plant or in the ground until ready to harvest, with some foods being canned.

4.9 Food Storage

Foods can be separated in to 2 categories those that require refrigeration and those which don't, for the majority of the year enough electricity will be produced through solar and wind power to run a small fridge, for a few months in winter when temperatures are low enough outside storage in insulated sealed containers will be sufficient.

I will preserve summer and autumn crops in glass jars on a weekly basis using a high pressure cooker and an electric hob powered from solar and wind power.

Root vegetables and apples can be stored inside in boxes separated by newspaper.

4.10 Costs – self-sufficiency - vegetables

Category	Annual Cost
Seeds	£24
Sundries (String, gloves etc)	£12
Mineral supplements	£21 (1/2 bag lime, 1 bag remin)
Compost (purchased)	£35 (5 bags TLC)
Total	£92

It's anticipated that soil enriching will take the full 5 years and it is thought that yields of vegetables will increase year by year. For the most part a "no dig" technique will be employed with twice yearly compost mulching taking place, this will reduce weeds allowing the soil structure to be undisturbed. I do have a rotavator however and plan to use it to initially break ground and from time to time if need be. Seedlings will be brought on within the poly tunnels and then sown in to the vegetable plot which will allow for some cross over of crops to make the most of the growing season.

4.11 Horticulture - Vegetable Gardens (income)

In addition to growing vegetables for my own consumption – I plan to grow vegetables for sale. I will develop crop choices in response to productivity rates and market forces. My main areas of focus in the early years will be strawberries, tomatoes, salads and early potatoes and I will use polytunnel's to accelerate/increase growing conditions for these crops.

4.12 Horticulture - Poly tunnels

My intention is to have 6 small poly tunnels with each having dimensions of 7.3m x 2.46m. The poly tunnels will contain raised beds, and some crops will utilise fish boxes which have been salvaged from local beaches.

Where possible recycled materials will be used for construction, poly tunnel construction will be :-

Free standing 7.3m x 2.46m, base will be constructed from railway sleepers with hoops constructed from MDPE water pipe with a diameter greater than 50mm lined with self-adhesive foam tape and skinned with polythene sheet with a wooden constructed door at one end.

Early potatoes will be grown in rotation (each polytunnel - every 3 years), with the seed being chitted in the cabin in November. The aim will be to harvest them by May 1st, where they get a premium price of £90/ 25kg sack. Most of the other polytunnel crops will be grown in recycled boxes – with the ground sown with green manure or mulch (and for the most part shaded for the growing season).

Strawberries will be grown in rotation – with outdoor beds set aside to raise runners until the plants come into full productivity (year 2 – 3).

2 polytunnels will be used for tomatoes with a range of varieties chosen for their uniqueness and productivity. Each polytunnel will contain 26 fish boxes (salvaged of local beaches) measuring 0.8m x 0.45m with each box containing 2 plants, totalling 104 plants.

2 poly tunnels for strawberries, chosen for their taste and productivity. Each poly tunnel will contain 26 fish boxes (salvaged of local beaches) measuring 0.8m x 0.45m with each box containing 5 plants, totalling 260 plants.

2 poly tunnels for salad leaf (including edible flowers). Each poly tunnel will contain 26 fish boxes (salvaged of local beaches) measuring 80 cm x 45 cm with successive sowings of salad leaf rocket, lettuce, spinach, oriental greens, herbs etc, marketed with a range of different mixes.

Crop	Plant numbers	Area	Expected yield after 5 years	Price/ unit (wholesale)	Projected turnover
Early potatoes (first early)	216	36m2 (grown in 2 polytunnels)	72kg	£3.60/kg	260
Strawberries (everbearers)	260	52 boxes (grown in 2 polytunnels)	70kg	£7/kg	490
Tomatoes	104	52 boxes (grown in 2 polytunnels)	260kg	£4/kg	1040
Salad leaf (following on from early potatoes)	Sowings in quick succession	52 boxes (grown in 2 polytunnels)	38kg	£10/kg	380
Total					2170

In addition, I will grow strawberries and salad leaves in outdoor beds. I will use hoop cloches to protect the fruit from rain damage.

Crop	Plant numbers	Area	Expected yield	Price/ unit	Projected Turnover £
Strawberries (summer)	240	40sqm	80kg	£7/kg	560
Strawberries	Preparatory	40sqm	0		0
Salad leaf	multiple	80sqm	160kg	£9 /kg	1440
Total					2000

4.13 Additional Crops

The following table gives an idea of the sort of range I would expect to be producing at year 5.

Crop	Plant numbers	Expected yield	Price/ unit	Projected Turnover £
Carrots	200	40kg	£1 /kg	40
Swedes *	50	12kg	60p ea	30
Cabbage	50	18kg	£1 ea	50
Onions	100	6kg	50p ea	50
Runner beans	30	30kg	£2.50/kg	75
Butter nut squash	15	75kg	£1 ea	45
Beetroot	100	25kg	£2/kg	50
Leeks	200	80kg	30pea	60
Broad bean *	15	45kg	1.50/kg	68
Total				728

* Winter crops

4.14 Horticulture - Flower garden

In addition to outdoor vegetables and polytunnel crops I will grow a range of flowers. I will begin with a range of perennial bulbs – narcissi, tulips and allium. Again the crop choices are going to develop in response to market forces, and the following table gives an idea of the range and quantity that I currently expect for year 5.

Flower	Plant numbers	Area (1 flower per bulb)	Expected yield after 5 years (with 20% losses)	Units (Wholesale)	Projected turnover £
Daffodil's	1000 60 bulbs per sqm	40m ²	2400 flowers (1920 flowers)	10 flowers per bunch, £1 ea	192
Tulips	1000 70 bulbs per sqm	40m ²	2800 flowers (2240 flowers)	10 flowers per bunch, £2 ea	448
Allium	500 30 bulbs per sqm	20m ²	600 flowers (480 flowers)	50p/ flower head	240
Mixed	Bulb production	80m ²			
Total					880

Note that I will be offering these to local florists, as well as direct to my other customers. My (wholesale) pricing reflects this.

4.15 Blueberries

Blueberries are an excellent crop for upland areas – thriving in the locality and giving reliable crops year on year. I will grow 80 blueberry bushes. Once they have established themselves (5 years) they will give a yield of 2.5 - 3kg per bush. Allowing for 20% losses to birds I expect to harvest 2kg per bush for sale. Currently blueberries sell wholesale for £10/kg. This will bring in an income of £1600.

4.16 Seedlings

I am currently growing and selling seedlings in pots on site; sunflowers, sweet peas, cornflowers, marigolds, beans, cauliflowers and tomatoes, selling for a £1 each. I have already sold over 200; and my costs are minimal.

I am hoping to sell 1,000 seedlings per year by year 5, my main target customers will be garden centres and landscape gardeners.

Costs:

Pots (3 inch) £110,

Seed (though I will be saving much of my own seed) £30

Compost (260 litres, purchased in bulk) £75

Labels £100

4.17 Willow trees

For the previous 12 months I have been propagating wild and basket willow trees which I have been selling both potted for £4 each and 10 cuttings for £4. I plan to scale this up so that I am selling 100 bundles and 250 pots a year

Costs:

Pots (5 inch) £167,

Compost (250 litres, purchased in bulk) £75

Labels £35

4.18 Willow lobster pots

I also intend to use basketry willow to make ornamental willow lobster pots. These will be non-functioning pots for ornamental purposes only. (Not included in projected income)

4.18 Grazing

Towards the top of my plot will be a grazing field. This will be fenced and let to tack sheep from time to time. The main purpose of this area is as a reserve expansion space for my land-based businesses – and it is too early to define the exact nature of these activities – for they will depend on my experience in the first 5 years. I will let the marketplace determine what works best – and shape my plot in response to this. If, for example, flowers are the most productive activity, then after year 5 I will expand into the grazing field with more flowers.

During the first 5 years one of my primary activities will be that of soil building – and so I will use the grazing area to help me in this regard. A field shelter will enable me to harvest manure from the grazers - effectively turning grass into fertility.

4.20 Horticulture - Projected turnover, costs and income

	Turnover Year 5 (£)
Polytunnel crops	2170
Outdoor strawberries and salad	2000
Outdoor vegetables	728
Flowers	880
Blueberries	1600
Seedlings	1000
Willow trees	1400
Total	9778

Costs

Strawberries will be packed in punnets and labelled, flowers would be banded in bunches, vegetables will be sold in paper bags. Transport represents 1 journey per week for 35 weeks.

Category	Cost
Seeds	£89
Sundries (String, gloves etc)	£25
Mineral supplements	£41 (1 bag lime, 2 bags remin)
Compost (purchased)	£70 (10 bags TLC)
Punnets	£70 for 850
Labels	£25 for 1,000
Paper bags	£40
Seedlings costs	£315
Willow Tree costs	£277
Stall fees	£350 for 6 months
Transport (see transport chapter)	£1127
Total	£2429

4.21 – Horticulture Income

My projected income from horticulture is £7349 at year 5

4.22 Horticulture - Outlets

Over the previous 2 years I have carried out a feasibility study in relation to marketing fruit and vegetables locally in Pembrokeshire. I have noted market prices and which crops retail the best and at what time of the year, I have visited farmers markets, car boots and Sunday markets to observe how market forces have shaped not only what is grown but what sells, supermarkets who have tremendous resources available for marketing provide many of the answers with what produce they have available. Supermarkets have the advantage of providing continuity of supply to customers but in most cases cannot provide the tractability of supply with confidence, and within this I have identified my customers. My aim is to find the shortest route between my small holding and local customers which will be vital to the overall efficiency and economy of the operation. Customers will be encouraged to visit the small holding to help make the link between produce they purchase and how it is produced. With Wales and Pembrokeshire both recently declaring a climate emergency and more recently the Covid 19 pandemic more people are

becoming more conscious of where and how their food is being produced, my marketing strategy is to understand their needs and implement the most effective marketing methods. Clearly demonstrating that my produce is grown in harmony with nature and with a very low ecological footprint, and getting to the end consumer in a short time after harvest, creating greater taste and longer shelf life will be a priority. Gaining Pembrokeshire certification and utilising the One Planet Councils 'One Planet Produce' label scheme, through working with Pembrokeshire County Councils Food Development officer Joe Welsh to join Pembrokeshire produce scheme, and will seek to ratify my produce from a trading standards perspective.

4.22 Business overview

Having been self-employed for 34 years, first as a fisherman catching/marketing both fin/shellfish and now in market garden/horticulture, I recognise that I have a lot of transferable skills in both marketing and handling perishable goods which can cross over.

Perishable produce only have a very limited shelf life following harvest. With small scale production also having the weakness in the market place of lacking consistency of supply.

Marketing needs to be very precise and pre-arranged to harvest to order. I will be following some basic principles of marketing, plants will be marketed at all stages from seedlings, mature plants right through to harvested fruit/vegetables. I will focus my primary energies on retail markets direct to the consumer and secondary to wholesale outlets. My aim will always be to provide market value and not to lose sight that sales are the key to success.

4.24 Retail (Website/social media)

My main and long term marketing aim is to establish a web site which can be updated with availability and quantities daily which I plan to link to twitter and facebook, as I build a customer base I will encourage customers to establish an alert on their twitter/facebook accounts. When I update the web site, I can click the twitter/facebook links which will send an alert to customers notifying of availability.

4.25 Retail - Supplementary (Pop up shops/ Honesty Stalls)

Careful consideration and in relation to specific demand within certain areas being identified I will establish pop up shops, which will open outdoors for a small window of a few hours, and if successful with the aim of making this a regular occurrence.

Initial focus will be on contributing to honesty stalls at various locations around the county, where possible on friend's properties which border main roads which have acceptable road side access for parking giving consideration to road safety to facilitate pulling over and pulling out.

4.26 Retail - Supplementary (Farmers markets/markets)

Farmers markets/markets represent a consistent and relatively cost effective opportunity to market to a broad based cross section of the public, weaknesses are that there is likely to be established market garden retailers and possible waiting list for stalls.

4.27 Retail (Website/social media)

My main and long term marketing aims is to establish a web site which can be updated with availability and quantities daily which I plan to link to twitter and facebook, as I build a customer base I will encourage customers to establish an alert on their twitter/facebook accounts. When I update the web site, I can click the twitter/facebook links which will send an alert to customers notifying of availability.

4.28 Wholesale

Wholesale outlets for the small producer represent reliable and consistent markets with little effort required for marketing, this direction does not appeal to me, unless a future co-operative locally is established which includes organised growing and a collaborative marketing approach.

4.29 Delivery route

The site is pretty central to 5 major market towns with good populations. Which will also benefit from populations from surrounding areas. Pembrokeshire its self has a population of 125,000

- Carmarthen is 24 miles and has a population of 13,760
- Pembrokedock is 14 miles and has a population of 9,753
- Cardigan is 16 miles and has a population of 4,000
- Haverfordwest is 14 miles and has a population of 12,042
- Narberth is 11 miles away and has a population of 2,489

It's difficult at this time to predict where a customer base will develop, but a weekly or two weekly harvest along with associated delivery won't require extensive driving, there are future possibilities for co-operative working with other local small holding which could take advantage of markets down the M4 corridor. Please see transport chapter for further detail.

4.30 Future development

My land based business may be in its infancy and yet to fully develop pending OPD planning approval, but I am confident with my experience as a fisherman marketing both through retail and wholesale that I will make a success of my business, as I feel my skills will be most certainly transferable, social media has now become firmly established as a platform for a successful marketing tool, having a presence opens up new opportunities of communication, as well as direct marketing which can be a highly successful way to generate sales with existing and potential customers.

I have contacted Pembrokeshire County Councils Food Development officer Joe Welsh and discussed joining Pembrokeshire produce scheme, and will seek to ratify my produce from a trading standards perspective.

I have also contacted Nerys Adams from Cywain to seek help with branding support and to create a logo, and Tyfu Cymru for horticulture innovation, insights, sector news and funded training.

I have also contacted Business Wales to have access to courses to support the establishment of starting and running a new business.

4.31 Income streams - overview

My chickens are projected to bring in an income of £484, and my horticulture activities an income of £7,349 by year 5.

My expected annual income from land-based activities at year 5 is £7833. This is more than triple my minimum income requirement – leaving no doubt that I am on track to meet the policy criteria.

The business plan is sufficiently robust and diverse to be able to carry any shortcomings in either production or sales.

4.32 House hold annual food spend

Household Annual spend	2019		5 years time
	Spend	Home Produced	Spend
Meat and meat products	0		0
Poultry Meat and poultry meat products	£408 (52 cooked chickens)		
Fish	£150 – (52 Salmon fillets)		Replaced by eggs
Fruit and vegetables	£549 – Sweet potato, carrots, apples, etc		
Oils and fats	£5		5
Dairy	£60 - Milk		60
Grain mill products	£39 – Rolled oats		39
Bread, biscuits and cakes	£50 – Multi grain bread		50
Cocoa and confectionary	£100 - chocolate		100
Other (inc preserves)	£25 - honey		
Non alcoholic beverages	£113 - tea		113
Alcoholic beverages	£50 - Beer		50
Eating Out	£100		100
Totals	£1,649		517

Year 1 & 2 would carry the highest capital expenditure for seeds, seedlings and trees, it's planned that once the initial stock was successful that annual planting would be propagated from seed collection/cuttings, to expand and maintain annual yields/harvests. Plant pots would be made from recycled plastic containers.

4.33 Minimum Income requirement:

Income requirements will drop as the site becomes more productive and meets my needs more efficiently.

Household needs		Annual spend Current £	Annual Spend 5 years' time £
Telecoms	Telephone/ internet contracts	208.56	208.56
	Telephone/ internet equipment	0	0
Clothing	New footwear	60	60
	2 nd hand footwear	0	0
	New clothes	140	140
	2 nd hand clothes	50	50
Food spend	See previous table	1649	517
	Cost of growing/ producing own food	0	92
Travel spend	See transport chapter for breakdown	491	491
	Public Transport	100	100
Tax	Council tax costs	728	728
	MINIMUM INCOME REQUIREMENT (£/annum)	3426.56	2386.56

Personal household costs are forecast to drop as the site becomes more productive as more of my needs are met from within the site resulting in less personnel journeys, less fuel being used and less food being purchased.

5 Land Management

5.1 Overview

An extended ecology survey report was carried out in March 2020 (Copy of which is included within this application)

5.2 Mitigation for visual impact:

I am planning further habitats (including hedges, coppice and forest gardens) that will screen the structures further. All structures will be built from natural material, the proposed residency a wooden cabin will be larch boarded to allow it to blend in to the surrounding countryside.

5.3 Habitat expansion and improvement

Only a very small part of the site will be fenced allowing for wild animals to have free access to roam. And forage. The site will be completely organic with permaculture principles being adopted.

5.4 Bat species

A set of bat roosting boxes will be installed on the cabin and the workshop/barn to encourage bats to roost on the site.

5.5 Birds

30 species have been recorded on the site, the hedgerows are suitable for a variety of common passerines; including dunnock, goldfinch, garden warbler, chaffinch, wren, robin, and blackbird. Four red-listed species are also present: **bullfinch**, **linnet**, **spotted flycatcher**, and **willow warbler**.

Bird nesting boxes with food stations will be installed within the site to encourage and support birds.

5.6 Securing and increasing diversification

Aspect	Category	Predicted change
New buildings and tracks	Semi-improved pasture	No loss of species. Track edges are likely to hold a high plant diversity in the long term.
New wooded habitats (orchards, willow bio-fuel and willow hedges)	Semi-improved pasture	No loss of species. Increase in plant diversity for orchard and willow. Increase in invertebrate diversity. Benefits to pollinators. Expansion of suitable habitat for red-listed bird species.
Cultivated land and garden	Semi-improved pasture	No loss of species. Increase in arable weed species. Increase in pollen source.

5.7 Butterfly's

The site will be planted with flowers some to be harvested and sold and some to be left to support butterflies and pollinators.

5.8 Pollinators

I intend to keep 1 hive of bees, but will be very conscious of supporting pollinators.

5.9 Biodiversity conclusions

All existing priority habitats will remain intact.

There are no predicted negative impacts on any protected or priority species.

There are no predicted negative impacts on the nearby SSSI/SAC sites.

The additional wooded habitats will improve the foraging quality for a range of priority and protected species, and increased plant diversity in these areas will also benefit invertebrate diversity.

The site has been designed with the intention of increasing the overall biodiversity of this site, it is anticipated that biodiversity will increase following the land use changes proposed by this development.

5.11 Time and land management

One of the fundamental aspects to success of the site will be in time and land management, the aim will be to keep the site productive without affecting Species diversity, I will do this by avoiding over exploitation, pollution and unnecessary habitat conversion, careful thought will go in to the introduction of any new plant species and how this may affect the integrity of the site. Unquestionably the biggest investment in time and resources will be the establishment of each area. The layout has been designed so that the plot can be managed and maintained with minimum labour inputs.

5.12 Forest garden

The forest garden is planned for 540m² and will contain a diverse variety of trees shrubs and plants to produce a broad base of fruits, berries and nuts which will be harvested to provide for my basic needs as well as ingredients for jams, chutneys, wines.

5.13 Chickens

The planned chicken area is 920m² which will be split in two areas, with only one area being occupied at a time, allowing for regeneration and re-planting of fresh seedlings to be undertaken.

5.14 Vegetable gardens

The planned vegetable garden is quite large at 1200m², initial development is planned to take a considerable amount of time and will be carried out throughout winter, this will be where my main focus for my work effort will be and it is anticipated to take the equivalent of two full days hours, planting seeds,/seedlings, mulching, composting, weeding, watering and harvesting.

5.15 Flower garden

Flower beds will be created within an area of 180m² and once initial planting has been undertaken the area will be mulched with bark to build the soil and suppress weeds,

5.16 Grazing

A small paddock of 1050m² will be created with a field shelter for animals at the top of the site, initial construction of the field shelter and erecting fences will take three or four days and will be the only area which will be fenced off. Once initial construction is complete the area will only require occasional maintenance, the area will require very little application of time, and because the area will be let out for tack for sheep my only work will be the removal of manure which will be a few hours a week.

5.17 Blueberries

It is my intention to develop my blueberry garden within an area of 330m² over a period of five years, where I will propagate blueberry bushes from cuttings from parent stock. Long term maintenance will be strimming and mulching around bushes, pruning and propagating cuttings as well as harvesting.

5.18 Willow coppice

Initial planting of willow coppies within an area of 2350m² will be labour intensive, but long term management will require little time, other than harvesting, as the areas around the trees will not be interfered with. It is expected that willow trees will take the full 5 years to grow sufficiently before harvest. Coppiced willow will be cut in a 3 year cycle with substantial timber being used for fuel, whilst branches and smaller timber will be used for mulching.

5.19 Overview of time (once areas are established)

Area	Hours/week/day
Forest Garden	3 hours a week
Chickens	1 hour a day
Vegetable garden	12 hours a week
Polytunnels	1 hour a day
Flower garden	3 hours a week
Grazing	3 hour a week
Blue Berries	2 hours a week
Willow Coppice	1 hour a week

Note that many of these activities are seasonal – and the time estimates have been averaged out.

Currently I am visiting the site 3 days a week for 6 hours a day and making good progress, most of my work is propagating plants establishing and developing areas, with very little time required to maintain what is already established.

6 Energy and Water

6.1 Water: Overview

There is no natural water on the site, all water will be from rainwater harvest for both personal use and watering plants, and it will be carefully managed and stored in potable containers for personal use and in large water containers on the site for plant irrigation. The table below gives an indication of the expected harvest throughout the year from various collection methods.

The geology of the site is about 2 feet of top soil 1 foot of sub soil/shale before a slate bed is found, this channels rainwater to the bottom of the field where reeds are found and the ground is considerably wetter.

The site is positioned on a gradient with all buildings near the bottom (entranceway) to aid access and logistics, rainfall harvest from structures will all be gravity fed.

6.2 Current rainwater harvest

Currently there is only one roof to harvest rainwater from, with three Containers which has been sufficient to provide water collect for a 30 metre x 16 metre vegetable plot and 200 flower pots and the nursery Area of fish boxes which requires 200ltrs when watering is required.



6.3 Water harvest calculation

North Pembrokeshire has an average annual rainfall each year of 1323 mm¹⁰. The driest months are April – July (with an average 73mm rain per month).

A cubic metre equals 1000 **litres** of water (1 IBC Container)

¹⁰ <https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gchzjb39w>

6.4 Expected rainfall harvest

Structure	Roof area m ²	Annual Harvest (1323mm) (1.3m)	Dry Month Harvest (73mm)(.073m)	Serves
Cabin	54.59	70,970 litres	3985 litres	Polytunnels
Workshop	13	16,900 litres	949 litres	Potable
Poly Tunnels x 6	107.76	140,088 litres	7866 litres	Self watering
Compost toilet	8.16	10,608 litres	595.68 litres	Reedbed
Chicken house	12.72	16,536 litres	928.56 litres	Chicken pond
Solar panels	25	23,500 litres	1825 litres	Polytunnels
Compost Bays	7.83	10,359 litres	572 litres	IBC's
Field Shelter	14.19	18,773 litres	1036 litres	IBC's
Total	229.99	319,122 litres	18,369 litres	

6.5 Domestic Water Use

The average person in the UK uses approximately 1050 litres of water per week. Due to my expected lifestyle (which includes using showers (instead of a bath), compost toilet (instead of a flush toilet) I expect my usage to be approximately 205 litres per week.

Shower – 40 litres/ twice a week

bowl wash 5 litres a day

Clothes washing (by hand) - 10 litres/ twice a week

Cooking/ washing up – 5 litres/ day

Drinking – 3 litres/ day

Veg prep – 2 litres/ day

It's expected that most personnel water usage could have a secondary use, with the exception of drinking water 150 litres could be used for watering plants

As a comparison; my current personnel water usage (prior to living on site) is 24 litres a day, this covers, drinking, washing and washing up. I drink 3 litres per day, I use 1.7 litres for cooking.

6.6 Water storage

A 1000 litre potable water store will harvest water for domestic use. It will collect water from the workshop roof.

4 x 2500 litre water containers will store water from the cabin roof – this will then be piped to the polytunnels.

2 x 2500 litre water containers will store water from the pv array - this will then be piped to the polytunnels.

4 x 1000 litre IBC containers will store water from the field shelter - this will then be piped to the polytunnels.

4 x 1000 litre IBC containers will store water from the compost bays - this will then be piped to the polytunnels.

6.7 Poly tunnels.

Poly tunnels themselves are expected to harvest over 140,000 litres of water, the majority of plants will be grown within fish boxes 0.8m x 0.45m with each poly tunnel housing 26 boxes, it is estimated each time watering takes place 260 litres will provide 20 mm of water within the boxes.

6.8 Vegetable plot

The vegetable plot will be outside so will have the benefit from rainfall, although it is expected from time to time irrigation will be required during the summer months (especially if planting out seedlings in hot weather).

6.9 Flower beds

The flower beds will be outside so will have the benefit from rainfall it is expected from time to time irrigation will be required during the summer months.

6.10 Forest Garden, Blueberries

The Forest Garden and Blueberries will be outside, so will have the benefit from rainfall. I will build up the soil in this area with top mulches, and this will increase the soil capacity for water retention. I do not expect these areas will require any additional watering.

6.11 Projected water usage.

Aspect	Daily usage.	Yearly usage.
Poly Tunnels.	263 litres x 160 days a year	42,080 litres
Vegetable Plot.	Will only require water in dry spells.	
Flower beds.	Will only require water in dry spells.	
Sheep	Estimated at 4 litres per ewe per day	2920 litres
Chickens	Estimated 2 litres of water per day	730 litres
Domestic Use.	29 litres per day	10,689 litres
Total		66016.4 litres

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6.12 Energy Overview

I intend to supply all my energy needs from renewable sources on the site with the exception of road vehicle fuel, chain saw fuel and a small amount of LPG for winter cooking. I want to be energy resilient and independent. I will have 1 x PC 250 watts, 2 x 1,000 watt electric oil radiators, 1 x 1,000 watt electric cooker, 240 & 12 volt lighting, 1 x 850 watt microwave, 1 x 2,000 watt kettle. Each appliance will be used in isolation and at times when peak power is available.

6.13 Current energy consumption

My electric reading from the beginning of July 2016 – Present (40 months) is 6308 units (KW hours). This is using an electric kettle, microwave, computer, lights and 2 x 1,000 watt oil filled radiators in the evenings during the winter (Nov – March). This is equivalent to 158 units a month.

At present my hot water/cooking is via a gas boiler of which I use 1.5x 47kg bottles of gas each yearWhen I used my central Heating I was using 1 x 47kg bottle of gas a month in the winter (Nov – March)

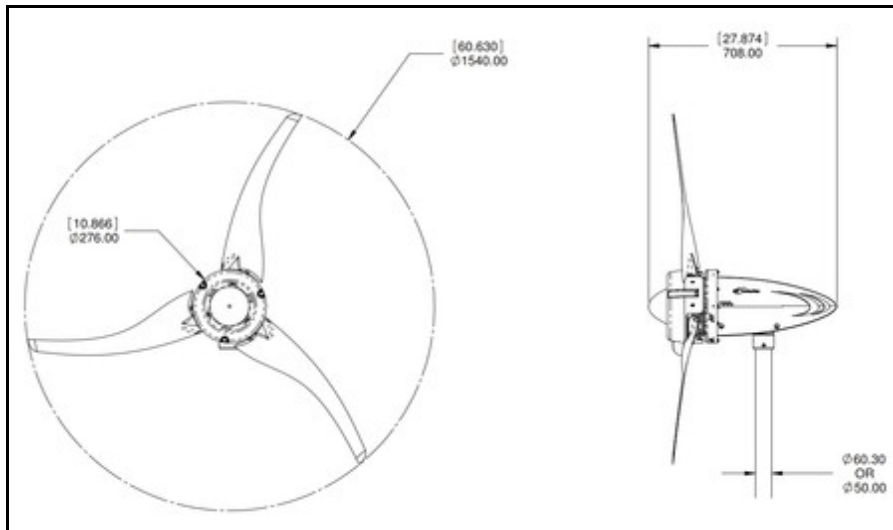
6.14 Solar Energy

Year 1 will see the introduction of an array of 10 Solar panels (10 x 200 watts) which will be mounted on a frame above ground level which will also be utilised for rainwater harvest, panels will be connected to a charge controller which will provide power to a bank of deep cycle batteries which will feed inverters. Year 2 will see the introduction of the second set of 10 solar panels (10 x 200 watts) charge controller, deep cycle batteries and inverters.

The 4kW array will generate an estimated 3562 kWhrs a year¹¹. This is substantially more than my current usage (158kWhrs/ month) in order to account for the seasonal variation of solar power.

¹¹ <https://www.pvfitcalculator.energysavingtrust.org.uk/>

6.14 Wind Turbine



I intend to install one LE-600 Leading Edge wind turbine¹² on an 8m mast.

It will be positioned in the vegetable growing area where it can benefit from the south-westerly winds.

It generates 160W when the wind is at 8m/s and up to 750W in high winds. I expect it to generate in the region of 300 kWhrs a year.

It is a very low noise turbine.

¹² <https://www.leadingedgepower.com/shop/store/wind-turbines/horizontal-axis-wind-turbines/le-600-wind-turbine-12-24-48v-1013011.html>

6.15 Bio-Fuel

For 10 months of the year renewable electricity will supply my heating and cooking needs. I intend planting a half an acre of bio-fuel on the site to provide me with a back-up heating/ cooking source during the midwinter months when there is insufficient electricity to meet my energy needs.

I estimate that I will need between 1 and 1.5 tonne biofuel per year.

SRC willow yields between 7 and 9 tonne per hectare.¹³ I plan to plant 2230m² SRC willow – sufficient to cover my most conservative estimates¹⁴. It will be harvested on a 3 year rotation with any surplus being chipped for mulch in the growing areas.

There will also be biomass harvest from the hedgerows (which include mature ash trees with dieback disease) and forest garden

6.16 Seasonal Energy Patterns

	Spring	Summer	Autumn	Winter
Space Heating	Dumping excess electric from solar and wind	ambient	Dumping excess electric from solar and wind	Biomass
Hot Water	Dumping excess electric from solar and wind	Dumping excess electric from solar and wind	Dumping excess electric from solar and wind	Biomass
Cooking	Electric (solar and wind)	Electric (solar and wind)	Electric (solar and wind)	Biomass
Electrical appliances (lighting, PC etc)	Electric (solar and wind)	Electric (solar and wind)	Electric (solar and wind)	Mix of solar and wind

¹³Source - John Nix Far Management Pocketbook 2013

¹⁴1.5 tonne at 7 tonne an acre.

7. Waste Assimilation.

7.1. Domestic food waste

All domestic food waste will be compost and used to increase soil depth and fertility.

7.2 Grey Water

All grey water will be re-used on site, the caravan/cabin will be connected to a reed bed system, which will be lined to enable adequate monitoring, biomass harvest and annual maintenance.

7.3 Human Waste

My intention is to use a compost toilet to manage human waste on site, ecological sanitation systems are systems which allow for the safe recycling of nutrients to crop production in such a way that the use of non-renewable resources is minimized.

7.4 Packaging and paper

Over the previous 6 years I have been conscientious in my consideration of my purchases in relation to un-recyclable packaging, and where possible purchase goods and food loose to avoid unnecessary packaging, where this has been impossible I have recycled plastic waste or found secondary use it.

7.5 Green waste

Green waste will be composted or used as mulch to create soil depth and fertility.

7.6 Green waste from growing food and Timber

All green waste from plants and trees grown on site will be composted and used on site to increase soil depth and fertility.

7.7 Livestock manure

All livestock manure will be used for compost to create soil depth and fertility.

8.0 Zero Carbon Buildings

Referring to Practice Guidance 3.81:

'For One Planet Development the zero carbon requirements relate to both domestic and ancillary buildings subject to Building Regulations control.'

None of the buildings require Building Regulations:

- The cabin which falls under the definition of a caravan, complying with size, construction and mobility test
- The compost toilet is less than 30m² and does not contain sleeping accommodation.
- The workshop, chicken house and polytunnels are agricultural buildings

Nonetheless all buildings have been designed to minimise their construction impact – using local and natural materials where possible, using recycled or reclaimed materials whenever available, and maximise their performance and longevity.

8.1 Outline Specifications: Cabin (Caravan)

◦ Create a terrace using topsoil and subsoil from track excavation to build up southern edge

◦ 10 x concrete pad foundations (300mm deep, 500mm x 300mm wide).

- Reclaimed brick/ block piers (minimum 300mm high).
- 150mm depth floor (local timber), lined underneath with OSB (FSC. Forest Stewardship Council certified), insulated with 150mm natural fibre insulation (either sheep's wool or wood fibre), timber floor.
- 150mm stud frame (local timber), braced externally with OSB (FSC certified), battened and timber clad. Finished internally with plasterboard (to ensure fire resistance). Insulated with 150mm natural fibre insulation (either sheep's wool or wood fibre). Double glazed windows.
- 150mm deep roof (local timber), Boarded with OSB (FSC certified) and finished in fibreglass. Internal ceiling of plasterboard, insulated with 150mm natural fibre insulation (either sheep's wool or wood fibre). Ventilated attic space (bat friendly). Guttering to connect with rainwater harvesting tank.

8.2 Outline Specifications: Workshop

◦ Create a terrace using topsoil and subsoil from track excavation to build up southern edge

- 4 x pad foundations (300mm deep) to support masonry piers made from reclaimed brick/ block.
- Shipping container placed onto piers, fixed in position with anchor bolts
- A simple monopitch truss roof is bolted to the top of the shipping container, extending out above the door slightly, and a steel profile sheet roof is fixed: this allows for rainwater harvesting.
- Note that the wind turbine pole is attached to the workshop roof. See energy chapter for wind turbine specifications.

8.3 Outline Specifications: Compost Toilet

- Double chamber composting box: Concrete slab foundation, Reclaimed brick/ block walls, door panels 25mm marine ply. Ventilated to two grills in east wall. This creates a secure waterproof vented chamber for composting.
- Other footings from reclaimed block/ brick on minimal foundations.
- 150mm depth floor (local timber), timber floor (locally sourced).
- 100mm stud frame (local timber), braced externally with OSB (FSC certified), battoned and timber clad (local timber). 2x reclaimed double glazed units set into wall as windows.
- 150mm deep roof (local timber), Boarded internally and externally with OSB (FSC certified), insulated with 50mm reclaimed insulation (to prevent condensation), ventilation grills behind eaves and finished in fibreglass. Guttering to connect with reed bed.

8.4 Outline Specifications: Chicken Coop

- 6 x Concrete foundations (300mm deep, 500mm x 300mm wide).
- Reclaimed brick/ block piers (minimum 500mm high to allow space underneath for dustbathing).
- 150mm depth floor (reclaimed timber), reclaimed plywood floor (to allow for ease of cleaning out bedding).
- 100mm stud frame (reclaimed timber), lined with chicken wire (to repel rodents), clad with timber (locally sourced). 4 x aperture grills to allow for ventilation. Hen nest boxes on the internal face of the east wall.
- 150mm deep roof (reclaimed timber), Boarded with OSB (FSC certified) and finished in fibreglass. Guttering to connect with water supply for hens.

8.5 Outline Specifications: Solar Panels

- 150mm treated timber frame (local timber – Cenarth), with treated posts sunk into the ground.
- Electrical shed incorporated underneath panels - reclaimed ply, batonned and clad (reclaimed timber).

8.6 Outline Specifications: Polytunnels

- Free standing 7.3m x 2.46m, base will be constructed from railway sleepers/or scaffold poles driven in to the ground, with hoops constructed from MDPE water pipe with a diameter greater than 50mm lined with self-adhesive foam tape and skinned with polythene sheet with a wooden constructed door at one end. All materials will be up cycled from TBS Recycling or sourced from sustainable resourced materials where possible.
- Skins will be polythene tops with debris netting below to allow tunnels to breath, a wooden frame both inside and outside along the length and breadth(70mm x 10mm) will separate a secure skins whilst holding guttering

9 Community Impact Assessment

9.1 Positive impacts

- I have a good relationship with my neighbours and neighbouring land owners.
- The site is in an isolated location so should have a very limited impact, and it's my intention to avoid over development in the countryside.
- I use local shops and the garage in Maenclochog/Glandy Cross/Crymych where I already purchase food, hardware and diesel.
- The project will have a low ecological footprint.
- I will provide high quality organically grown produce which will be sold locally.
- Should any negative impacts surface, I will carry out an assessment and mitigate to reduce or remove the impact.
- Both Welsh Government and Pembrokeshire county Council have declared a "Climate emergency" one planet living is a growing culture which is providing education, example and inspiration, living a one planet life will help with climate and look after the planet.
- The project aims to have a positive pro-active impact on the local area and community.

9.2 Negative impacts and mitigating measures

- To a certain aspect there will be some negative impact in terms that the site will through the development introduce new structures in to the countryside. The site will be well planned in relation to visual impact, location of structures will be carefully planned and where necessary trees will be planted to provide screening to reduce unnecessary visual impact.
- Social visits will be limited to friends and family which will be very small but are also very difficult to quantify, the majority of visits will be from local friends and are likely to tie in with work help or exchange.
- Transport impact associated with land based business will be limited to supply and sales.

10 Transport Assessment and Travel Plan

As well as being a keen walker over the previous 10 years I have become a keen cyclist, so much so that I am now on my second bicycle, having already completely wore one out, and think nothing of undertaking 20 mile round trips, as well as keeping myself fit, I am also achieving a zero carbon footprint on some of my transport journeys. I use trains and buses whenever I am traveling light.

10.1 Transport Baseline

At present I live 22 miles from the site, so have a round trip of 44 miles each day which I am travelling 4 – 5 times a week to carry out work on site. And often leave site during the day to collect bits and pieces.

10.2 Vehicle

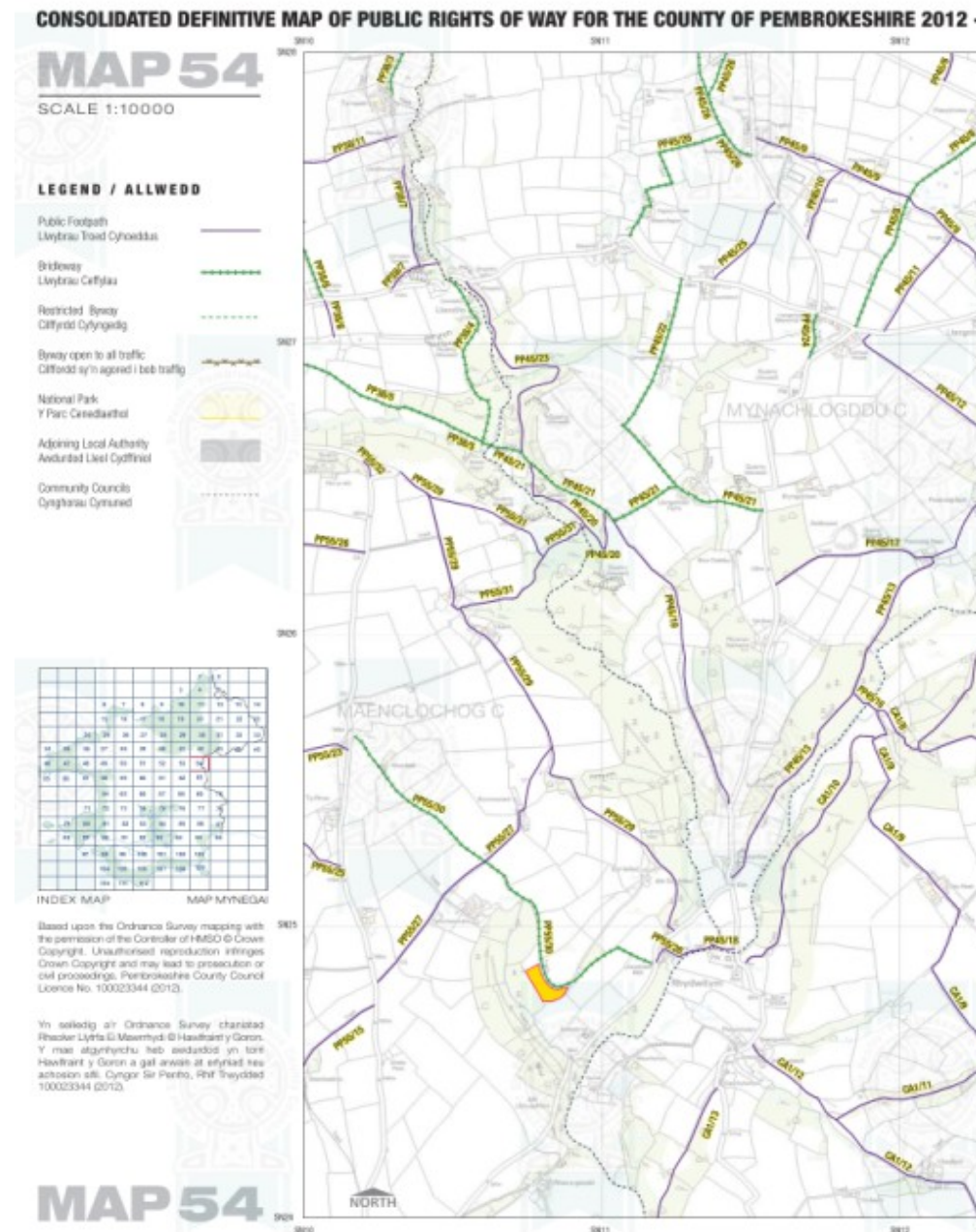
I do intend to run a vehicle which at present is a Iveco Daily van but intend to limit its use for essential journeys which are impractical to be undertaken by cycling or walking, most of the journeys using a vehicle will be linked to transporting and delivering produce linked to my land based business. For non-local journeys I intend to use the train.

10.3 Cycle/walk

- Maenclogog is 3.3 miles - It takes 17 minutes to cycle and 40 minutes to walk to Maenclogog .
- Clynderwen is 4.5 miles – It takes 20 minutes to cycle and 50 minutes to walk to Clynderwen, where there is also a train station.
- Haverfordwest is 12 miles – It takes 1hr 10 minutes to cycle.
- Clarbeston Road is 7 miles away and takes 40 minutes to cycle.

10.4 Bridle ways/footpaths

The area the site is located within has a considerable network of bridleways and footpaths which support low impact commuting.



Note that the plot borders bridleway PP55/30 marked green above which considerably shortens the cycling/walking journey to Maenclogog

10.5 Train

Clynderwen and Clarbeston Road both have railway stations and are on the main line between Haverfordwest and Cardiff with trains running every day.

Buses

430 : Cardigan - Narberth (Passing through Clynderwen) (Monday – Saturday)

642 : Crymych – Clarbeston Road (Friday only)

644 : Rosebush – Clarbeston Road (Tuesday only)

313 : Clarbeston Road – Haverfordwest (Monday – Saturday)



10.6 Vehicular journeys associated with the site

Personnel journeys by vehicle will decrease as each year goes by, year 1 will create the most journeys but it is expected that by year 5 vehicular journeys will only be associated with the land based business and visitors, all personnel journeys will be carried out by cycling, walking or by public transport.

10.7 Vehicle journeys associated with work and land based business

Journeys associated with work and land based business will be consistent, but it's important to realize that the ecological footprint for these journeys sits with customers and employers. I intend to utilise these journeys to combine picking essential items up for both personal and site construction.

10.7 Year 1

Will undoubtedly create the most journeys for the site, as so much is hoped to be achieved. There are 16 separate tasks listed within the phasing of proposals (18.2) for year 1 where construction materials will need to be brought on to site together with visitors who hopefully will help with undertaking work on the site, and land based business journeys which will carry out deliveries once a week and residential journeys to attend my part-time job in Argos (50 mile round trip), it is anticipated that a journey will take place almost every day.

Year 1 – private vehicle use					
	Household				Other
	Domestic journeys (including family and social visits)			Construction on site collection and deliveries	Visitors to the smallholding
Number of journeys	Combined with other work			170	52
Estimated mileage (total)				3400	

Year 1- Land based business					
			Land-Based Enterprises		
Work description		Other work (part-time) Argos	Deliveries (based on 100 mile round trip 26 weeks a year) and other journeys connected with business		
Number of journeys		104 (Both ways)	36		
Estimated mileage (total)		2288	3000		

10.7 Year 2

Journeys during year 2 will be greatly reduced as the majority of the infrastructure would have been put in place during year 1. Year 2 is built around introducing livestock and becoming more present on the site after giving up my employment at Argos. I expect to replace my Aros work with a local job one day a week. Residential vehicle journeys should be phased out in favour of walking, cycling and public transport. Visitors who will be helping with work on site will be encouraged to use public transport. Journeys associated with the land based business for deliveries will be co-ordinated to take place once weekly and seasonally throughout the growing season.

Year 2 – private vehicle use					
	Household		Land-Based Enterprises		Other
	Domestic journeys (including family and social visits)			Construction on site collection and deliveries	Visitors to the smallholding
Number of journeys	26			40	52
Estimated mileage (total)	1300			800	

Year 2 – Land Based business					
	Household		Land-Based Enterprises		Other
		Other work (part-time)	Deliveries (based on 100 mile round trip 26 weeks a year) and other journeys connected with business		
Number of journeys		50	36		
Estimated mileage (total)		1000	3000		

10.8 Year 3

Year 3 will see another reduction in journeys to and from the site as I concentrate more on building the land based business and developing the marketing plan. Visitors will be encouraged to use public transport. Deliveries connected with the land based business will again be weekly a seasonal throughout the growing season.

Year 3 – private vehicle use					
	Household		Land-Based Enterprises		Other
	Domestic journeys (including family and social visits)			Construction on site collection and deliveries	Visitors to the smallholding
Number of journeys	26			40	52
Estimated mileage (total)	1300			800	

Year 3 – Land Based Business					
	Household		Land-Based Enterprises		Other
		Other work (part-time)	Deliveries (based on 100 mile round trip 26 weeks a year) and other journeys connected with business		
Number of journeys		50	36		
Estimated mileage (total)		1000	3000		

10.9 Year 4

Year 4 will hopefully see the journeys to and from the site level out and become more consistent with achieving an acceptable use of the vehicle, where journeys are only carried out when necessary.

Year 4 – private vehicle use					
	Household		Land-Based Enterprises		Other
	Domestic journeys (including family and social visits)			Construction on site collection and deliveries	Visitors to the smallholding
Number of journeys	26			10	52
Estimated mileage (total)	1300			200	

Year 4 – Land Based Business					
	Household		Land-Based Enterprises		Other
		Other work (part-time)	Deliveries (based on 100 mile round trip 26 weeks a year) and other journeys connected with business		
Number of journeys		50	36		
Estimated mileage (total)		1000	3000		

10.10 Year 5

Year 5 – private vehicle use					
	Household		Land-Based Enterprises		Other
	Domestic journeys (including family and social visits)			Construction on site collection and deliveries	Visitors to the smallholding
Number of journeys	26			10	52
Estimated mileage (total)	1300			200	

Year 5 – Land Based Business					
	Household		Land-Based Enterprises		Other
		Other work (part-time)	Deliveries (based on 100 mile round trip 26 weeks a year) and other journeys connected with business		
Number of journeys		50	36		
Estimated mileage (total)		1000	3000		

10.11Year 5 Transport Breakdown

	Domestic	Land-Based Businesses	Other work	Total
Mileage m (km)	1300 (1950)	3000 (4500)	1000 (1500)	5300
Proportion %	25	57	18	
Purchase £	63	143	45	250
Maintenance £	50	114	36	200
Litres of fuel	166	385	128	679
Fuel £	216	501	166	883
Insurance £	96	219	69	382
Tax £	66	150	47	263
Total £	491	1127	363	1981

10.12 Transport strategy

Being aware that my biggest potential impact for increasing my ecological footprint and my potential failure to reduce my global hectares per person to 2.44gha and move towards 1.88gha by year 5 is through the over use of motor vehicles. Although I also have to accept that without the initial impact taking place, logistics, construction and development would be almost impossible, but as the benefits of constructing structures on site will be benefited over decades, it is feasible to pro rata the impact over the life of the structures. But once the site is developed it is envisioned that my personal global hectares per person will reduce dramatically. As part of my annual review all traffic will be monitored, recorded and reviewed on an annual basis.

My strategy will include

- Car sharing where possible.
- Take advantage of companies/businesses delivery services.
- Collective purchasing.
- Purchase essential food/consumables monthly.
- Walk whenever possible.
- Cycle whenever possible.
- Use public transport (Buses, Trains)
- When it is time to replace my vehicle – I will replace it with a more fuel efficient model.

11 Ecological Footprint Analysis

The Welsh Government EFA calculator was used for these figures. The excel spread sheet is included as part of the planning application.

Notes

- Row 11: I expect the stand alone pv system to cost in the region of £2,000 to install (panels up cycled from TBS recycling), and the wind turbine to cost in the region of £1400 to install
- Row 12: I expect the cabin (caravan) to cost in the region of £5,000 to build (note this is materials cost, and granted a low cost, as the vast majority of materials will be up-cycled from TBS recycling which will include internal fitting out by way of a donor static caravan – I will provide the labour)
- Row 16, Column 2: total vehicle cost (£1,000 every 4 years)
- Row 73, size of plot: considered as 42% of chicken area plus forest garden area plus 15% of vegetable garden plus cabin footprint - 1263m²
- Row 74, Animal feed costs: considered as 67% of pullet chickens feed plus 18% of laying hens - £94

I calculate my ecological footprint to be **2.33** gHa/ cap on first habitation, dropping to **1.39** gHa/ cap after 5 years. The National average is 4.88 gHa/cap.

Other Footprints

Whilst the EFA analysis undertaken is very comprehensive, it is essentially based on domestic lifestyle patterns and some elements of the project do not fall within its remit. These have been identified as:

Negative influences:

- Social visitors

The ecological impacts of our friends and family will be small. The bulk of these visits will be from local friends who will be tying in practical exchanges of produce and tasks. It is very difficult to quantify these impacts at this stage, however we expect it to be in the region of 1 visit per week

- Business Impacts

The land-based businesses will inevitably carry an ecological footprint of their own. Because the business will be off-grid this footprint is going to be relatively small, its largest factor being transport. I estimate that travel associated with the land-based businesses will be in the region of 3000 miles per year.

- Other work

I expect to continue working off-site one day a week

Positive Influences:

- Local healthy food

I will be supplying organic local healthy food to the local community. Wales currently imports an estimated 93% of its vegetables and 97% of its fruit¹⁵ - I will help to reduce the ecological footprint of this.

- Demonstrating a sustainable lifestyle

The project will promote both the concepts and practicalities of a One Planet Development offering a positive contribution to the local community and Wales as a whole.

¹⁵ This figure is taken from the One Wales:One Planet document

12 Transition

Work on the site begun in February 2020 before my One Planet Development application was submitted. The site, the application and some of the infrastructure are all funded by the sale of tangible assets from my previous fishing business, which were sold in September 2018 which have left me without a main income, so it was important to make the site productive and begin to meet some of my needs

I have recently started a part time job at Argos Pembroke dock where I work 9 – 15 hours a week for 3 evenings as a delivery assistant, putting deliveries away, and starting work at 8.30pm. I intend to maintain the job for the first two years following the success of my application, for this reason my land based business has to begin in February 2020, although I don't expect it to be profitable for the first few years, whilst capital is reinvested in the site and plants are propagated.

12.1 February 2020

During March 2020 the top soil was removed from the access to improve the logistics to the site.

The composition of the ground is made up of 1 foot of top soil and about a foot of subsoil mixed with slate which covers a shale bed, the shale was exposed to provide a workable surface to assist logistics on to the site.



12.2 March 2020

Nearly all of March was spent digging by hand and with a rotator



12.3 April 2020

Topsoil removed from the access was utilised to fill fish boxes which will be used as raised beds/nursery for seedlings.



Due to a late start it was decided to dig drills removing all stones and roots as there was insufficient time to import manure or woodchip to create no dig beds.



Fish boxes with soil are stacked on top of a single box to raise them further from the floor to propagate seedlings, seeds where very difficult to source because of Covid 19 restrictions.



Over 200 willow cuttings have been planted either side of the access and to build hedges up.



12.4 May 2020

Planting seeds began late April with potatoes, leeks, onions, cauliflowers, carrots, peas, swedes, salad leaf, herbs, beetroot, cabbage, asparagus, squashes, pumpkins

Planted in 2020 Veg/Berries/flowers/trees	Plant numbers
Potatoes	50
Cauliflowers	70
Swedes	100
Onions	80
Carrots	150
Broad beans	60
Leeks	30
Beetroot	60
Cabbage	60
Brussel sprouts	40
Salad	30
Squashes	15
Pumpkins	10
Asparagus	10
Blue berry bushes	2
Blackberry bushes	5
Marigolds	50
Sunflowers	20
Basket willow trees	150
Potted Basket willow	70
Hawthorn (potted)(Rootstock for apple trees)	10
Rowan tree	1
Birch Tree	1
Parsley (Curled)	10
Basil	10
Sage	10

12.5 June 2020



12.6 July 2020



12.7 August 2020



13 Phasing of proposals

13.1 Year 1

Year 1 main priority will be to establish the site and secure it environmentally to put systems and infrastructure in place to maintain and support existing eco systems

- Plant willow boundry
- Plant bio fuel (Autumn)
- Build compost toilet.
- Install 10 solar panels.
- Move on to site in a caravan/shepherds hut.
- Provide for my water needs 100% (Rainwater harvest)
- Provide for my power needs 100% (Solar/wind power)
- Construction of access tracks and paths access.
- Build 6 poly tunnels. (Strawberry plants)
- Continue to establish the vegetable plot.
- Plant Flower beds.
- Plant apple trees and establish the orchard. (Autum)
- Provide some income from the land based business from the sale of sale of strawberries, flowers and vegetables.

13.2 Year 2

- Install second set of 10 solar panels.
- Build Chicken coop and introduce chickens.
- Plant forest garden.
- Build cabin. (Winter)
- Provide an income from the land based business from the sale of Strawberries, flowers and vegetables.
- Build workshop. (winter)
- Install wind turbine.

13.3 Year 3

- Give up my job at Argos. (Look for part time work - 1 day a week - local to the site)
- Provide an income from the land based business from the sale of Strawberries, flowers and vegetables, baby vegetables.
- Build workshop. (Winter)

13.4 Year 4

- Provide an income from the land based business from the sale of Strawberries, flowers and vegetables, baby vegetables, plants

13.5 Year 5

- Provide an income from the land based business from the sale of Strawberries, flowers and vegetables, baby vegetables, plants, ornamental willow lobster pots.

14 Monitoring

An annual monitoring report will be produced that will include:-

- An EFA progress report : a commentary on changes made since the previous year that are likely to impact upon the households and other footprint.
- An EFA assessment in years 3 and 5
- A revised management plan in year 5 and every 5th year after.
- An evaluation detailing the proportion of food derived from the site (as set out in 3.23 – 3.25 of the practice guidance)
- An assessment of the projects minimum needs(as set out in 3.27 of the practice guidance)
- An evaluation of the land based production (as set out in 3.28 – 3.29 of the practice guidance)
- Clear evidence that the residential use continues to be clearly linked to the management of the land.
- An assessment of the energy needs and productivity of the site.
- An assessment of the water needs and sources within the project.
- Annual monitoring of community impacts, with mitigation measures being implemented to balance any negative impacts.
- A short commentary on the environmental health of the site’s habitats and biodiversity including references to the objectives described in the land management section.
- Annual assessment of the transport impact of the site against the travel and transport assessment plan(including data on the number and nature of vehicle trips generated by the site)

15 Exit Strategy

Within the one planet development practice guidance the requirements of the essential characteristics of one planet developments in the open countryside are described in paragraph 1.9.

In line with the one planet development practice guidance 5.11, failure to achieve one or more of the essential characteristics set out in 1.9 would constitute a failure of the site as a whole.

Should there be a failure of the site as a whole, my exit strategy is that access tracks will remain. All trees which have been planted including willow bio-fuel, forest garden and orchard will also remain.

- The cabin will be lifted on to a lorry and taken away.
- The workshop roof will be dismantled and all materials will be recycled. The container will be removed from the site.
- The compost toilet will be dismantled and all materials will be recycled.
- The solar panels (pv array) will be dismantled and removed from the site
- The wind turbine will be taken down and removed from the site.
- The compost bays, field shelter, chicken shed and poly tunnels will also be removed, although if the plot continues to be used for horticulture there is a strong case for retaining these structures and I would hope that the LPA would be of a mind to consider their retention if this situation arises (though I recognise that a separate planning application may be required for this).