Vermiculture

– system design –

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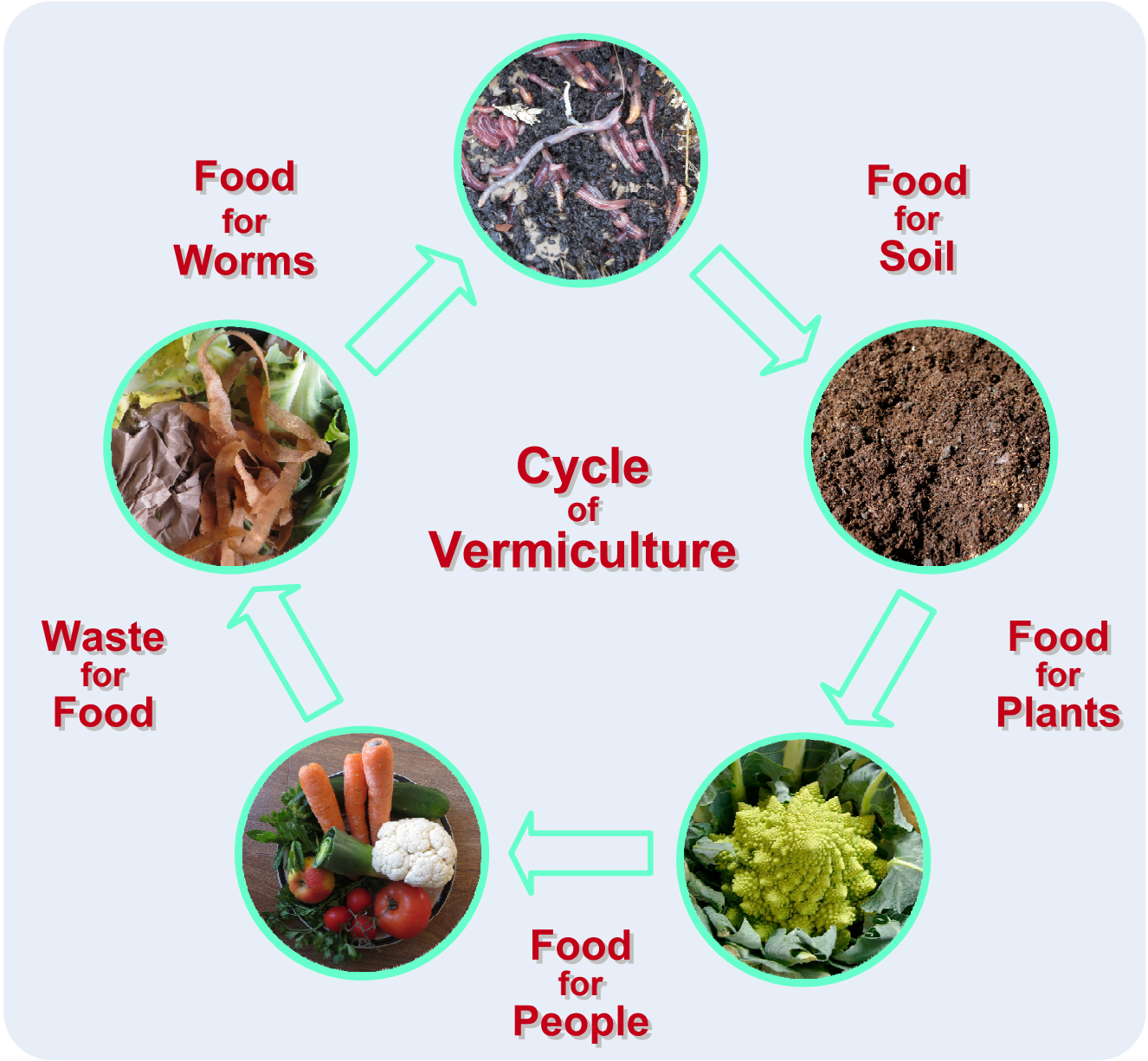
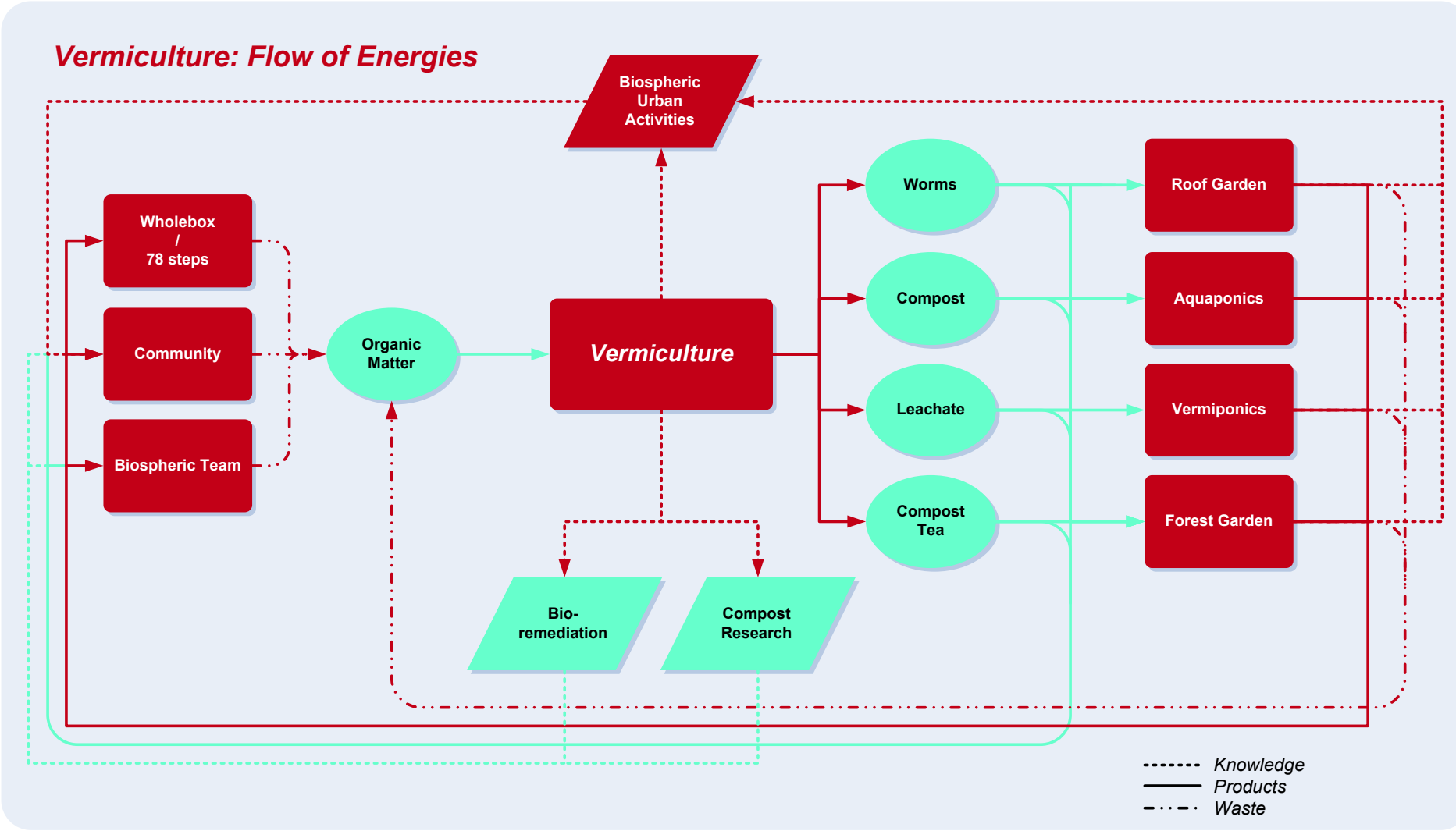
Biospheric Project

Analysis & Assessment


Food
for
Worms
Food
for
Soil
Cycle
of
Vermiculture
Waste
for
Food
Food
for
Plants
Food
for
People


Vermiculture: Flow of Energies
Biospheric Urban Activities
Wholebox / 78 steps
Community
Biospheric Team
Organic Matter
Vermiculture
Worms
Compost
Leachate
Compost Tea
Roof Garden
Aquaponics
Vermiponics
Forest Garden
Bio-remediation
Compost Research
Knowledge
Products
Waste

Vermiculture: Element Analysis

Products & Behaviours

Worm Castings
(worm-compost)

Leachate
(worm-mucus)

Food for fish

Warmth

Attraction of Vermin
(when uncovered)

Soil aeration

Smell
(when unbalanced)

Needs

Organc matter

Moisture

Oxygen

Bedding
(straw/carton)

Soil/Compost

Other worms

Protection

Intrinsic Charactaristics
(red wiggler worms)

Epigeal
(active in matter -above soil; in groups; suitable for warmth)

Colour
(deep red)

Fast eaters

Fast reproduction

Suiteble for this climate

Vermiculture: Care

We don't like

- **Meat**
- **Garlic**
- **Chillies**
- **Dairy products**
- **Too much citrus**
- **Too much oil/grease**
- **Too much cooked foods**
- **Non-organic materials**
  (e.g. plastics, metals. glass)

We like

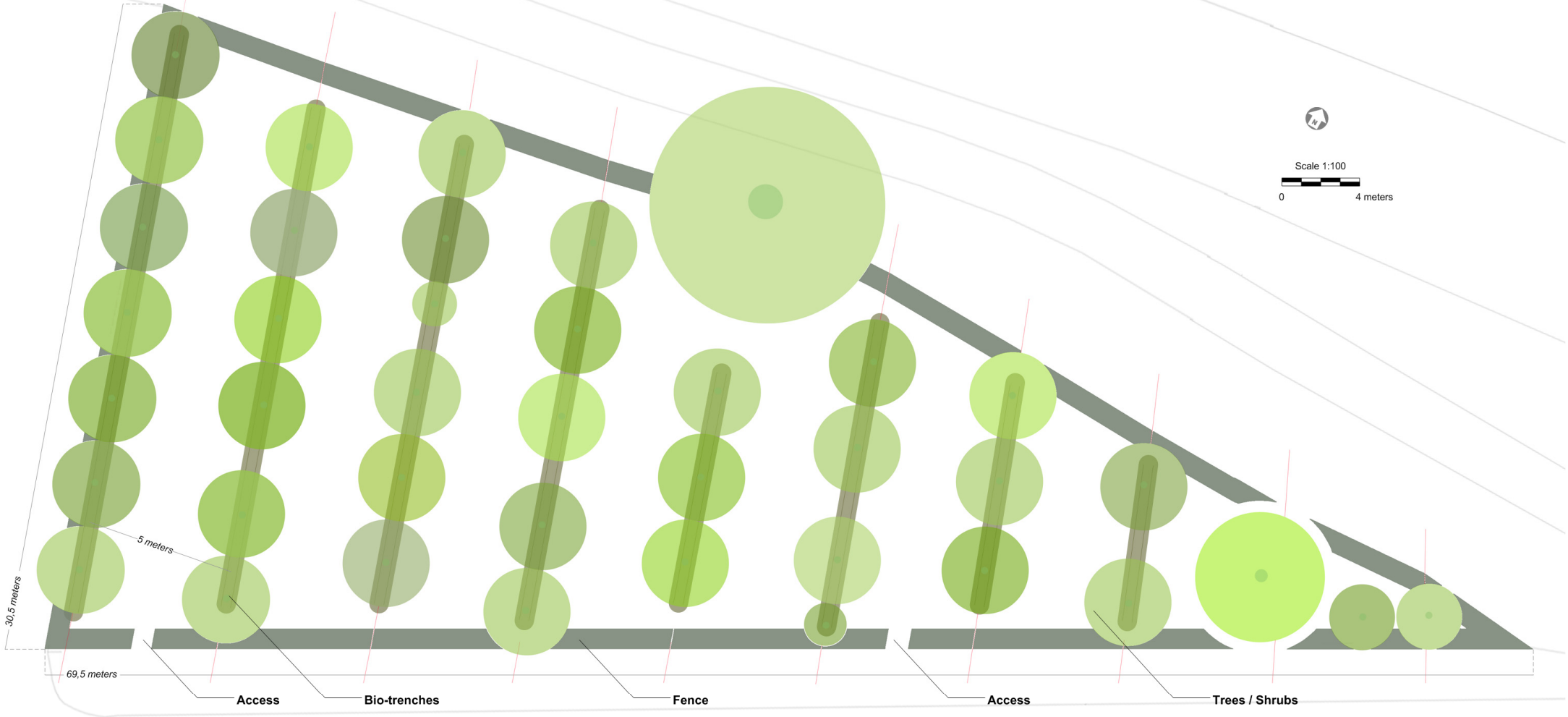
- **Hair**
- **Fungi**
- **Egg shells**
- **Food scraps**
- **Coffee ground**
- **Tea bags**
- **Carton / Paper**
- **Straw**
- **Leaf litter**
- **Manure**
  (aged and not from pets/human)

Imbalances

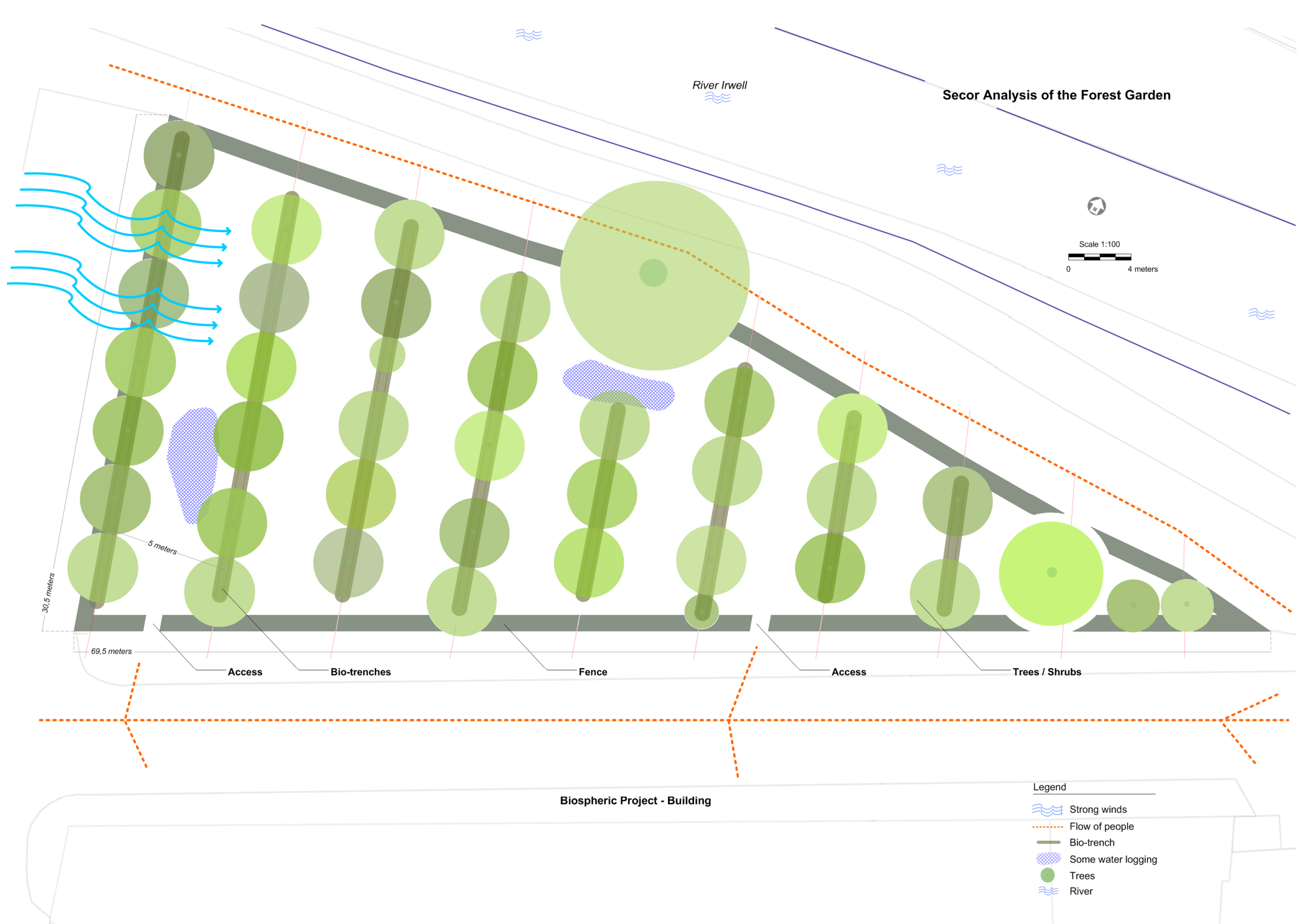
- **Dry**
  (Add moisture and if needed add food scraps)
- **Soggy**
  (Add dry brown materials like carton)
- **Flies**
  (Add dry brown materials like carton)
- **Mould**
  (Add less starchy materials like rice or bread)
- **Vermin**
  (Cover all entrances)
- **Migrating worms**
  (Too little food or too wet)

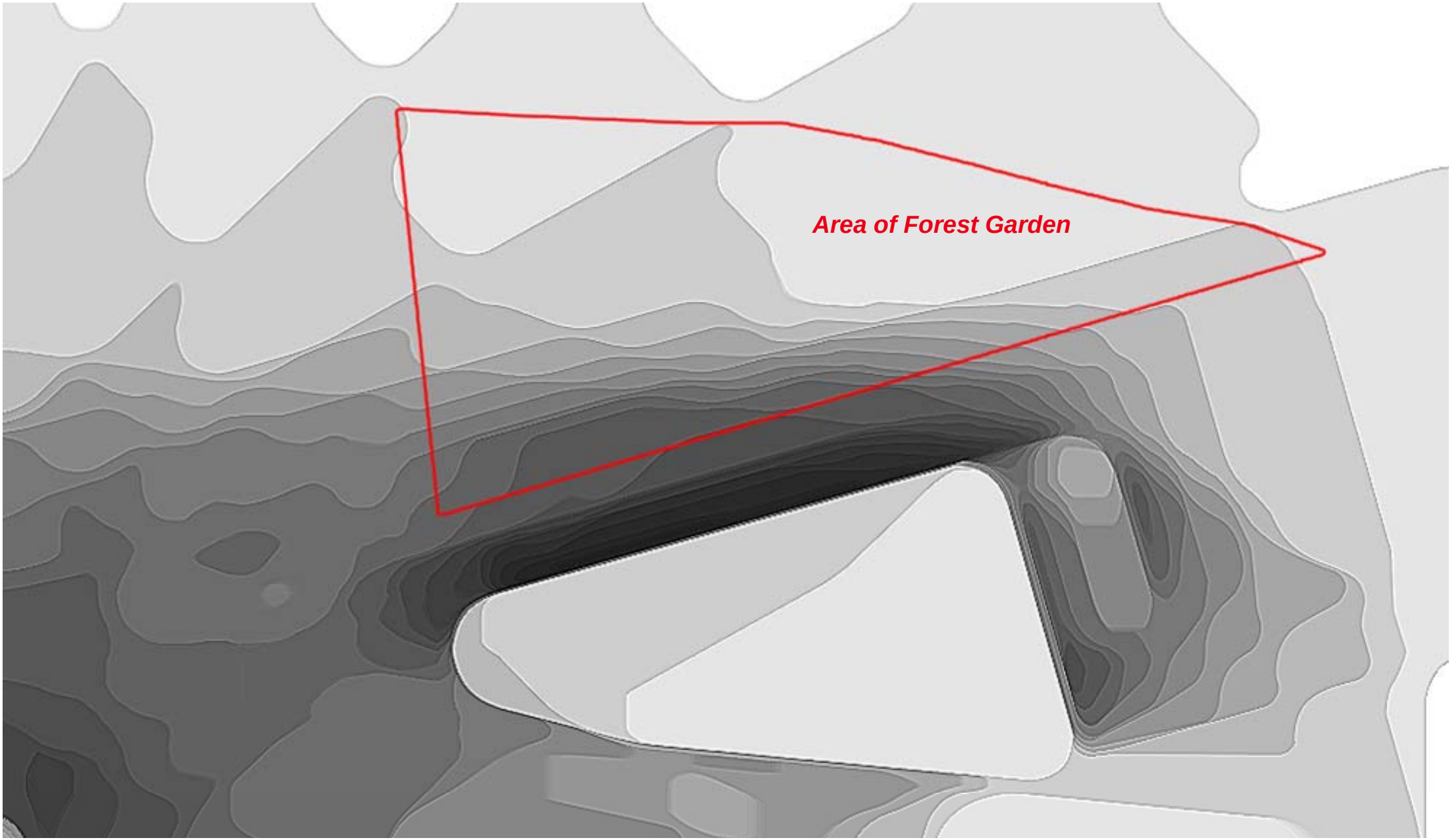
Maps

Base Map of the Forest Garden



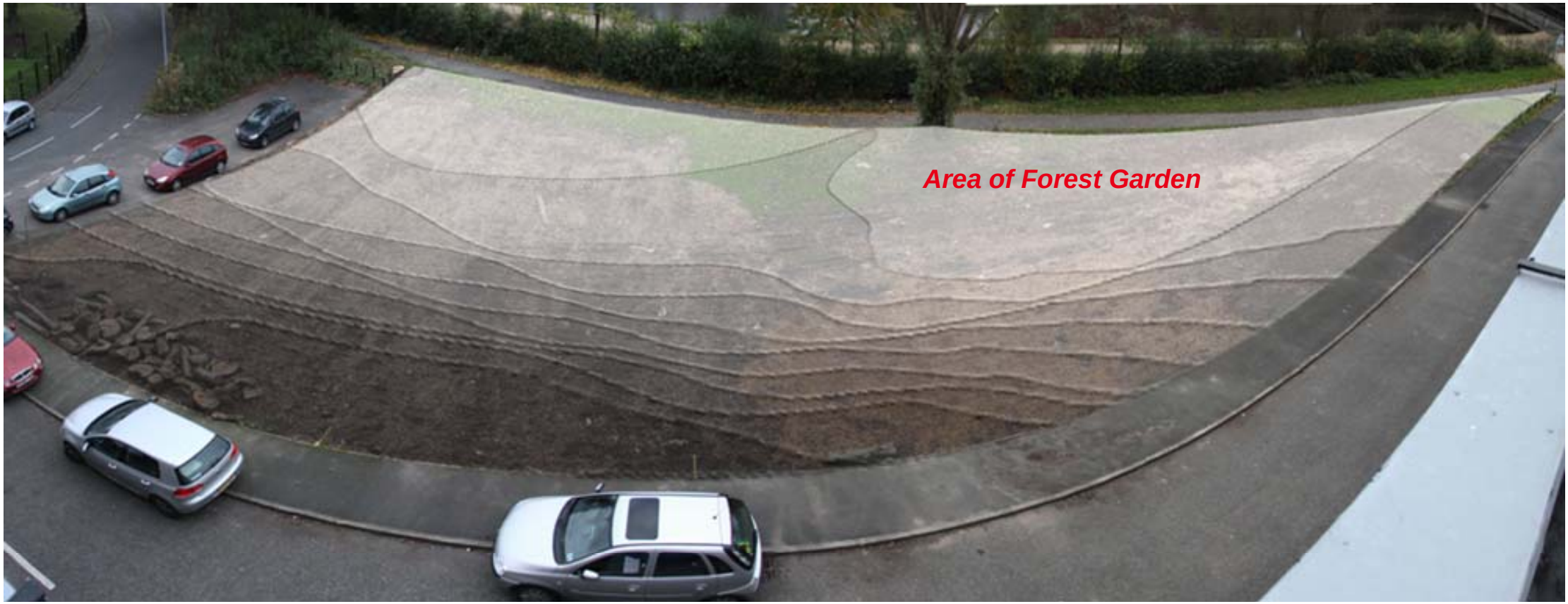
Biospheric Project - Building


River Irwell
Secor Analysis of the Forest Garden
Scale 1:100
0
4 meters
5 meters
30,5 meters
69,5 meters
Access
Bio-trenches
Fence
Access
Trees / Shrubs
Biospheric Project - Building
Legend
Strong winds
Flow of people
Bio-trench
Some water logging
Trees
River



Shadow map of the Community Forest Garden

Solar exposure is influenced by surrounding buildings.
The darker the area, the less solar exposure.

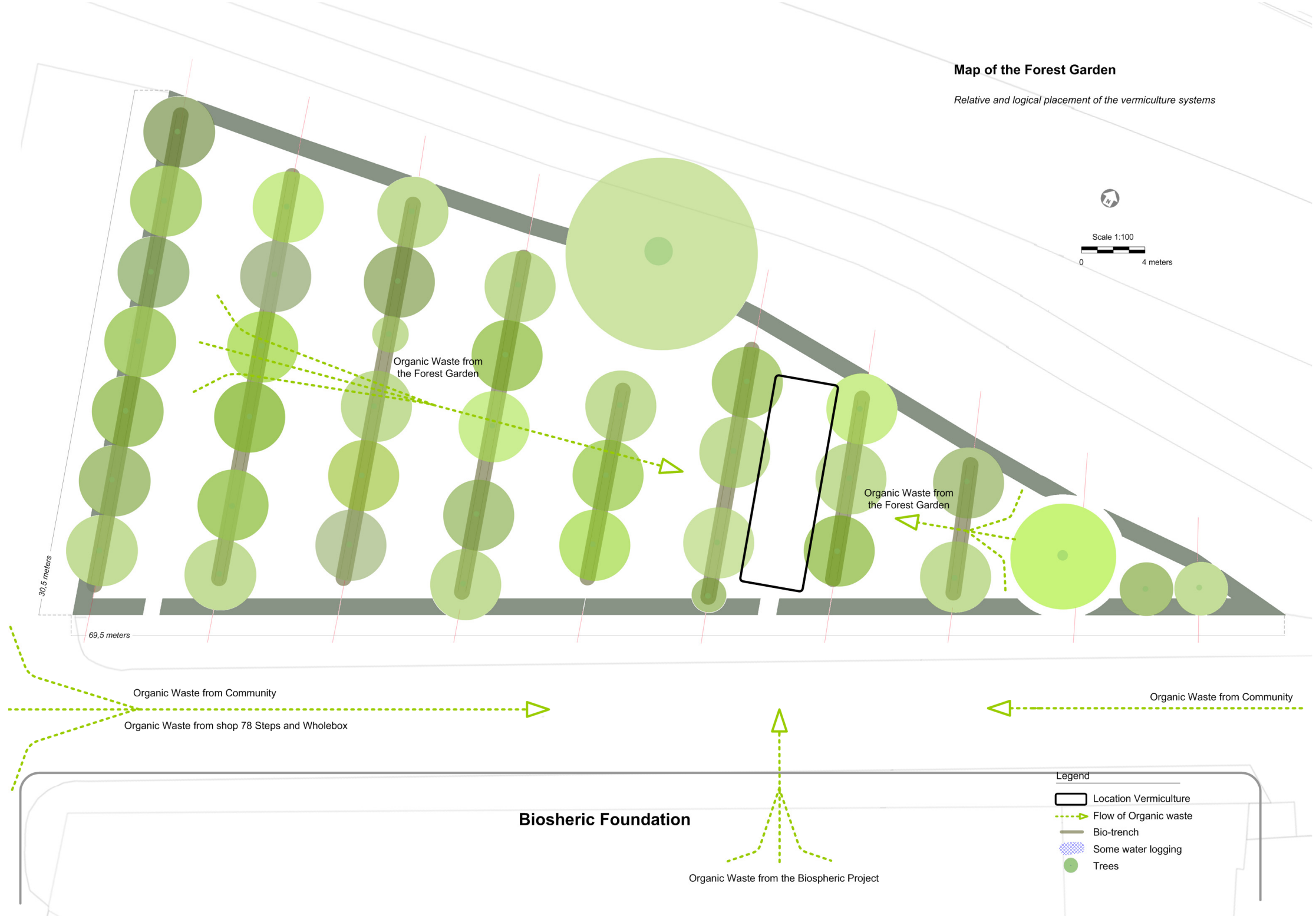


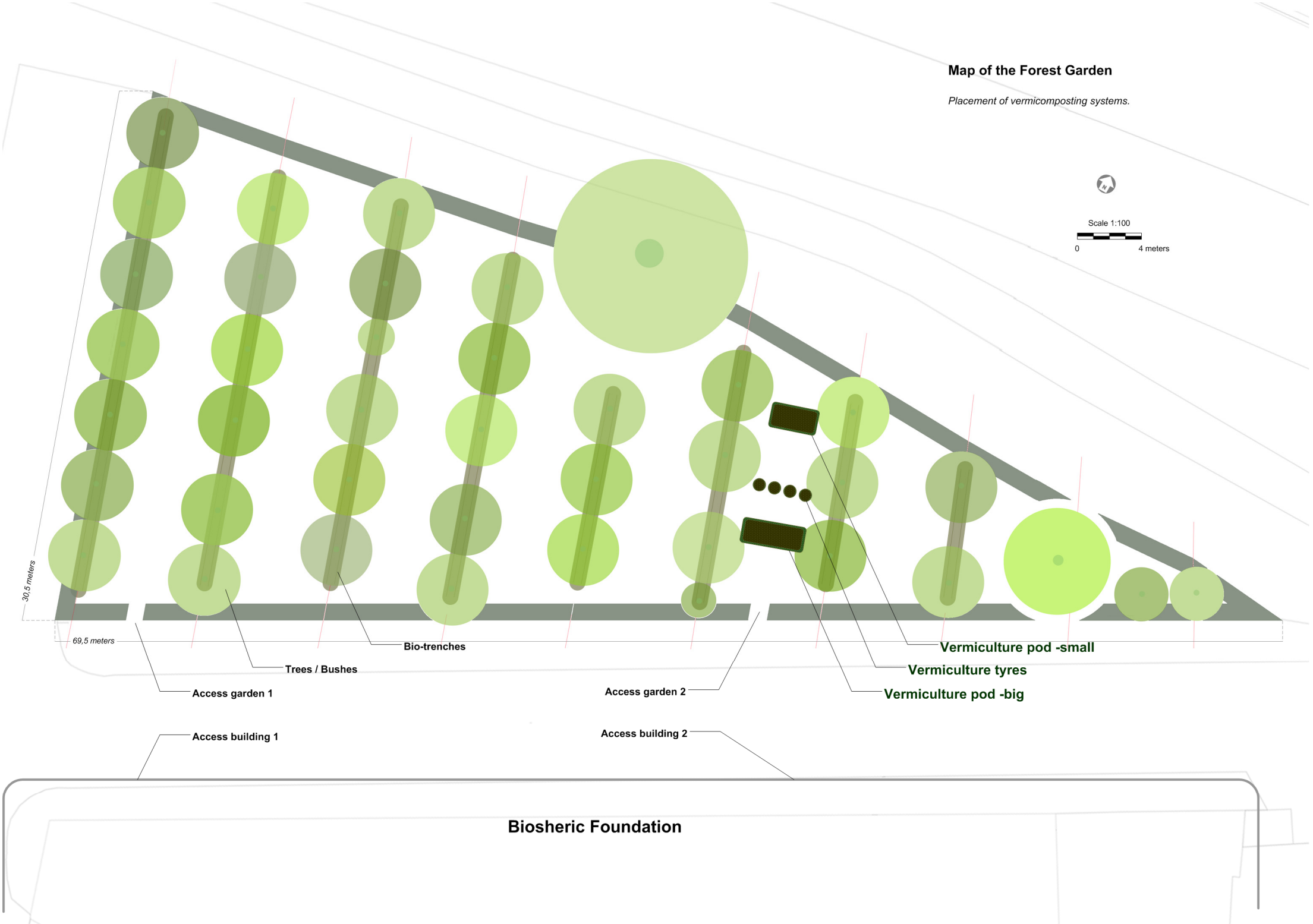
Shadow map - top view overlay

Solar exposure is influenced by surrounding buildings.
The darker the area, the less solar exposure.

Map of the Forest Garden

Relative and logical placement of the vermiculture systems




Map of the Forest Garden
Placement of vermicomposting systems.
Scale 1:100
0
4 meters
30,5 meters
69,5 meters
Bio-trenches
Trees / Bushes
Access garden 1
Access garden 2
Vermiculture pod -small
Vermiculture tyres
Vermiculture pod -big
Access building 1
Access building 2
Biosheric Foundation

Implementation Plan

Work Plan

Activities	Days	1	2	3	4	5	6	7	8	9	10
Design	2										
Prepare area	1										
Collection materials	2										
Assembly large pod	½										
Fill large pod	½										
Construct tyre-stack	½										
Fill tyre-stack	½										
Assembly small pod	½										
Fill small pod	½										
Total Days									**8**		

Requirements worm pods

Material

Worm pods	Metal mesh	Compost / Soil
Metal brackets	Container	Worms
Side boards	Straw	Organic matter
Piping	Carton / Paper / Burlap	Tarp

Construction worm pods

Preparation

- Level ground with slight slope of 5%
- Place pods
- Connect piping as you place pods, downwards
- Cover drains with metal mesh
- Connect pods with metal brackets
- Attach sideboards (plastic/wooden boards)

Filling

- Add straw on sides (for breeding) and light on bottom
- Add layer of carton / paper; 15 cm
- Wet this layer well
- Add little compost (or good topsoil) for inoculation
- Add a good layer of organic matter, 5 cm
- Add a little more compost (or good topsoil)
- Relocate the worms gently into their new habitat

Finishing

- Cover with carton / burlap / straw
- Cover with tarp when needed (excessive rain/sun)

Requirements car-tyre worm bin

Material

Used car tyres; 5 per stack	Straw	Worms
Strong plastic / metal mesh	Carton / Paper / Burlap	Organic matter
Lid / Tarp	Compost / Soil	

Construction car-tyre worm bin

Preparation

- Level ground with slight slope of 5%
- On bottom tyre place strong (metal/plastic) mesh
- Place first tyre as base

Filling

- Add straw in sides (for breeding) of all tyres
- Add layer of carton / paper; 15 cm in base
- Wet this layer well
- Stack other 4 tyres on base
- Add some compost (or good topsoil) for inoculation
- Add a good layer of organic matter, 5 cm
- Add a little more compost (or good topsoil)
- Relocate the worms gently into their new habitat

Finishing

- Cover with carton / burlap / straw
- Cover with a strong lid / tarp

Maintenance Plan

Maintenance Plan

Activities	Frequency	Duration	Until	Who	Difficulty	Heaviness
1. Check for imbalance	weekly	15 mins	Ongoing	BF team	6	1
2. Check if ventilation is sufficient	weekly	5 min	Ongoing	BF team	5	1
3. Check cover	weekly	5 min	Ongoing	BF team	2	1
4. Add appropriate organic waste	3 weekly	30 mins	Ongoing	BF team	3	3
5. Check correct moisture level	3 weekly	15 mins	Ongoing	BF team	6	1
6. Check speed of waste processing	3 weekly	15 mins	Ongoing	BF team	6	1
7. Keep system/ surrounding area tidy	3 weekly	15 mins	Ongoing	BF team	1	3
8. Harvest leachate	sporadic	30 mins	Ongoing	BF team	3	3
9. Harvest compost	3 monthly	2 hrs	Ongoing	BF team	6	4
10. Distribute worms to other systems	3 monthly	1 hr	Ongoing	BF team	5	3