The Bigger Picture

moving through the
Ski Arlberg resort in
No-Snow Conditions

Explore Lab Graduation | Valentin Zech | 4587979
Booklet 2/8

The Bigger Picture

moving through the
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Snow Conditions

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All photos in no-snow conditions were taken by me during the fieldtrip in October. The altitudes shown correspond to the pictures taken then.

The photos in snow-conditions were taken during countless ski vacations either by me, a friend or any member of my family. When possible, the exact location and altitude match the photos on the left. Otherwise, they are very similar.

1495m

1800m

1900m

9

10

Brownfields

Brownfields are “the legacy of contaminated and derelict lands that have been left by industrial activity”[1] Think, for example, about the Ruhrgebiet with its abandoned coal mines and factory buildings. A walk through a ski area in snowless conditions allows for a glimpse at what it might look and feel like as a brownfield: a left-behind production landscape, steel and concrete infrastructures that are rendered useless, and nearly empty towns down in the valley. It feels strange, almost illegal, to be there when none of the lifts are in use. And as nonhumans find their comfortable spots in between lonely lift stations and piste-signs, the strangest moments happen when subtle signs of human presence show: a blinking light on a lift pole or turned-on computers in a control room.

Brownfields

In winter conditions, hints of brownfields are nowhere to be found. The mountainsides are sizzling with (human) life - children screaming, speakers blasting, snowmachines hissing. Hundreds of people rush up and down the hills, shops and restaurants in the towns are fully-stocked. None of the infrastructure feels too strange, at least as long as you don’t think about it too consciously. Because it’s all being used, it seems to make sense. The first cracks in this cozy winter feeling emerge when you spot green patches in the landscape and realize that there is much less snow than a few decades ago. This feeling is quickly forgotten, however, when the adrenaline rushes through your body during the next descent through the beautiful winter landscape. Still, it is easy to imagine that now abandoned coal mines were once busteling with life, too.

2040m

1700m

1620m

Machinery

The machinery of a brownfield is “how the industrial landscape was made, how its various components functioned, and what impact production has had on the shape of the land”.[2] In other words, it is the physical and spatial reality of a brownfield; contaminations and physical left-overs from the processes and systems that used to make up the industrial activity. The machinery of a brownfield contains lots of embedded information: the objects and marks in the landscape tell stories about ourselves, our world views and intentions. In the 6 booklets about the machinery, those embedded narritives are collected and made visible.

Machinery

Without the machinery - lifts, pistes, snow machines, restaurants, avalanche safety equipments, fencing, and wayfinding signs - the ‘mass production’ of winter tourism as we know it today would not exist. During the industrial revolution, the transition from muscle-driven processes to steam and electricity powered systems made efficient large scale production possible. Before the introduction of machinery to ski areas, ski fanatics relied on guides to find the best patches of snow in a vast landscape. It was only possible to ski (safely) with the in-depth knowledge about the terrain and the snow conditions of a local guide.[3]

2150m

2250m

2100m

Walking

At walking speed, the perception is very finely-grained: your movement through the different landscapes is slow and you notice small flowers, stones, and each screw on the machinery. The perception when going up and down is similar. Walking is so natural to us humans that there is a lot of mental space left to look around while you are hiking.

Skiing

The speeds during skiing are much higher: an avarage lift ride is comparable to a bike ride in the city, the downhill skiing varies vastly depending on the slopes and skills of the athlete - from a bike ride to the speed of cars on a highway. Additionally, due to the fast pace and sometimes unexpected changes in terrein or snow quality, skiing requires a lot of mental focus; looking around happens mostly on the lift or during a break.

1750m

1790m

1900m

Altitude

The altitude is one of the most defining factors in the mountains. It influences which plants grow (or if they grow at all), which animals live there, how much water is available, how much snow falls, and how easy it is to get around - from driving, to walking and skiing, to climbing and flying. In addition, when moving through the mountain landscape without technological help, the change in altitude (meters climbed) is more relevant for the exhaustion than the distance travelled.

During no-snow conditions, those changes - even the subtle ones - are very easily noticed. Moving through the landscape, the appearance and experience changes depending on the altitude. There are also other factors that influence the type of landscape, e.g. orientation to the sun or the presence of a small river. Those smaller scale differences are also easy to see when there is no snow and can often change within a few meters of distance.

Altitude

When the entire landscape is covered in snow, it is harder to see the changes in the landscape. Plants and traces of animals, but even smaller and medium sized rocks and boulders are smoothed out completely and appear white.

The ‘altitude line’ that is still most noticeable is the tree line around 1700m. Above that height, the conditions are too rough for large plants like trees to grow - this is very visible even in winter conditions. The other indication of altitude while skiing is often steep and rocky terrain: most of the time, the lower pistes are easier (less steep), get more tricky higher up (steeper), and often stop completely before the very peak (almost vertical terrain).

2300m

2070m

1330m

Moving Through the Landscape:

En Route:
No-Snow Conditions

(Fieldtrip)

En Route:
Snow Conditions

(Nodes and Research by Design)

En Route:
Non-Humans in a Changing Climate

(Interview with Biologist, Movement of non-humans)

En Route:
No-Snow Conditions
(Fieldtrip)

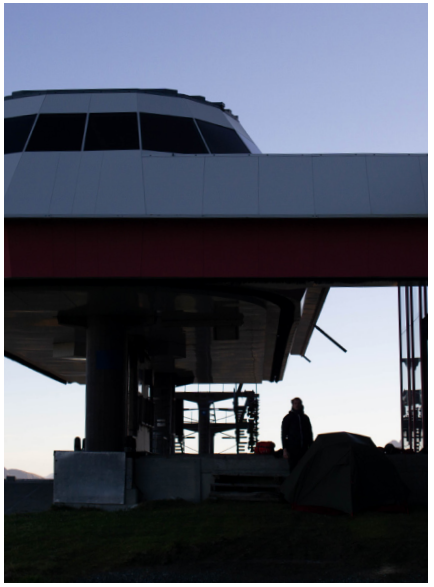
En Route: No-Snow Conditions (Fieldtrip)

Before the fieldtrip I roughly planned the route I wanted to walk using a set of requirements:

Walk the longest route through the ski area, from one "end" to another, to see as many different altitudes, landscapes, and infrastructures as possible. Especially the human-made parts can differ not only depending on the natural context, but also the political approach in each town.
Stay within the domain of the ski area. Sometimes, the hiking path network follows a very different route than right through the ski area. In those cases, I either found utility roads of the ski area or direttissima through the landscape.
Safety. Snow had already fallen around the highest peaks in the ski area, making some paths very dangerous – especially with thunderstorms forecast towards the end of the trip. Therefore, I made sure there were safe paths whenever the hike went through higher parts.

The planned route changed sometimes throughout the trip because of spontaneous factors:

Sleeping Places. (marked with an X on the map) We carried a tent and everything we needed to not depend too much on finding a prefect sleeping place every night. There are a few factors, however that make some sleeping spots much better than others (flat surface, shelter from the wind, nice views, possibility to charge cameras and lights), so sometimes the route changed for the prospect of a better sleeping spot somewhere else.
Unforeseen Interesting Activities and Places. Sometimes we encountered workers who were maintaining the infrastructure etc. We always tried to make the most of those moments and looked at what they were doing and engaged in conversation. Sometimes, this also changed the route of the trip.

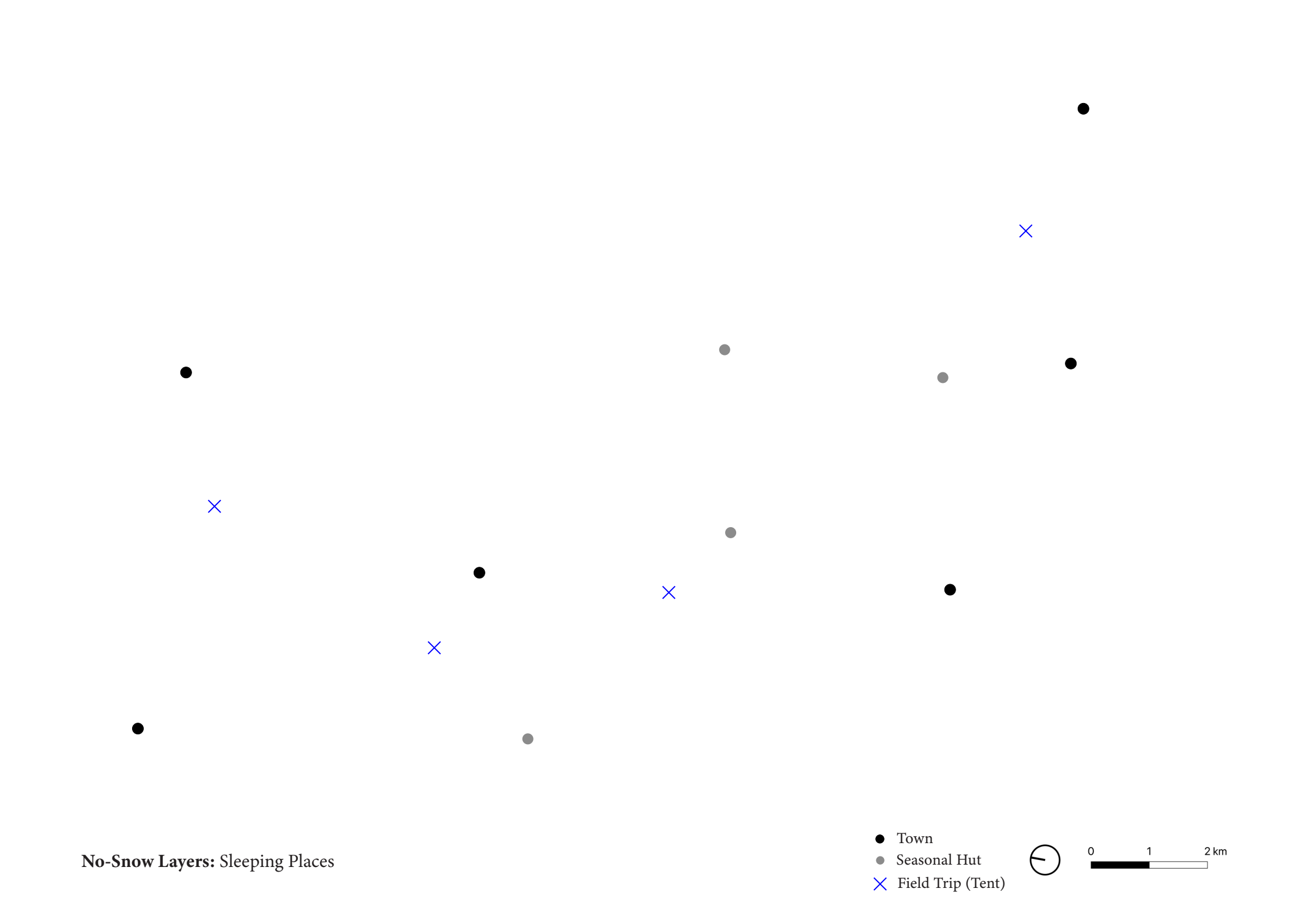


1st Night: 2048m, Top Station Wartherhorn Express

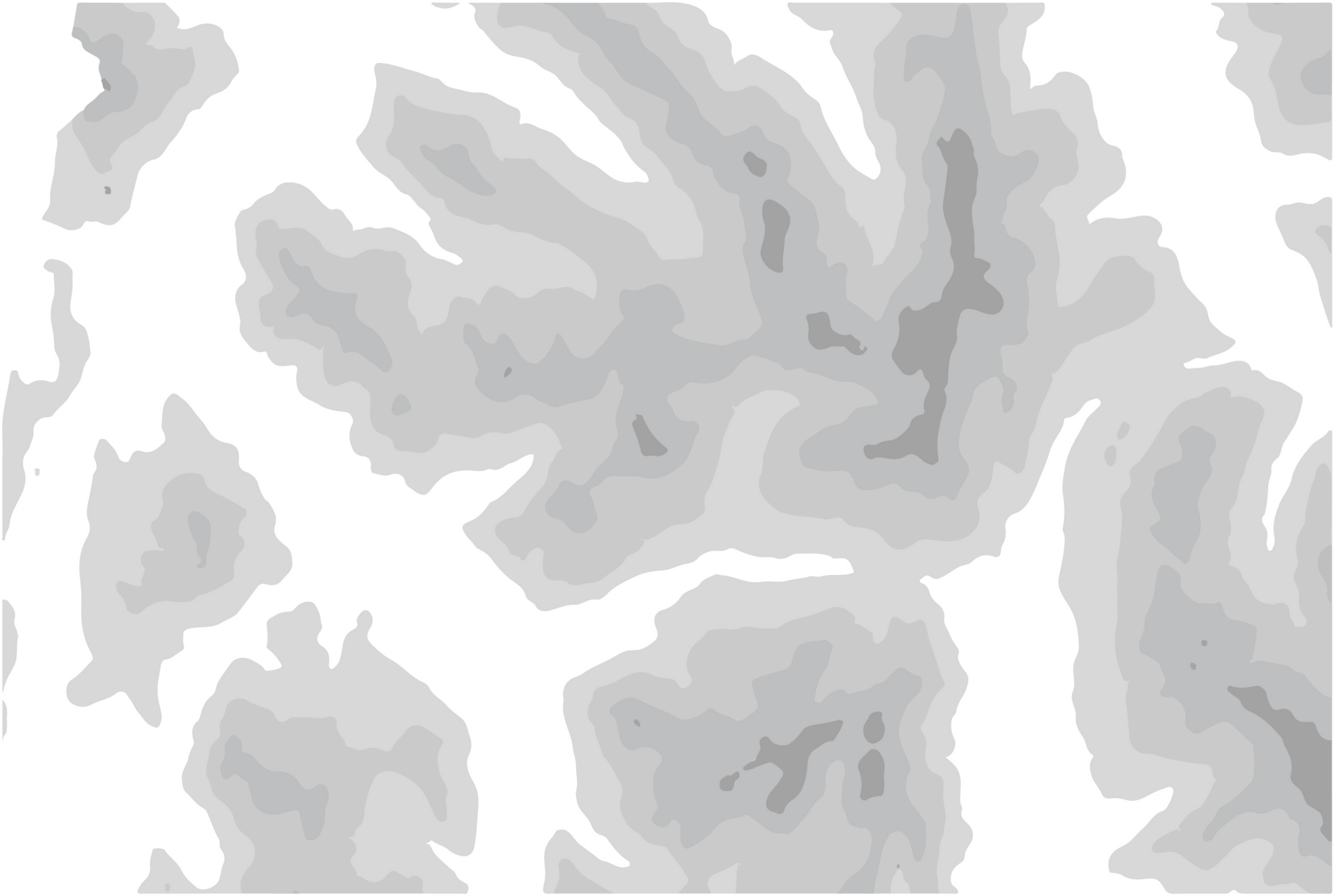
2nd Night: 1808m, Top Station Schlegelkopf

3rd Night: 1939m, Madlochalpe

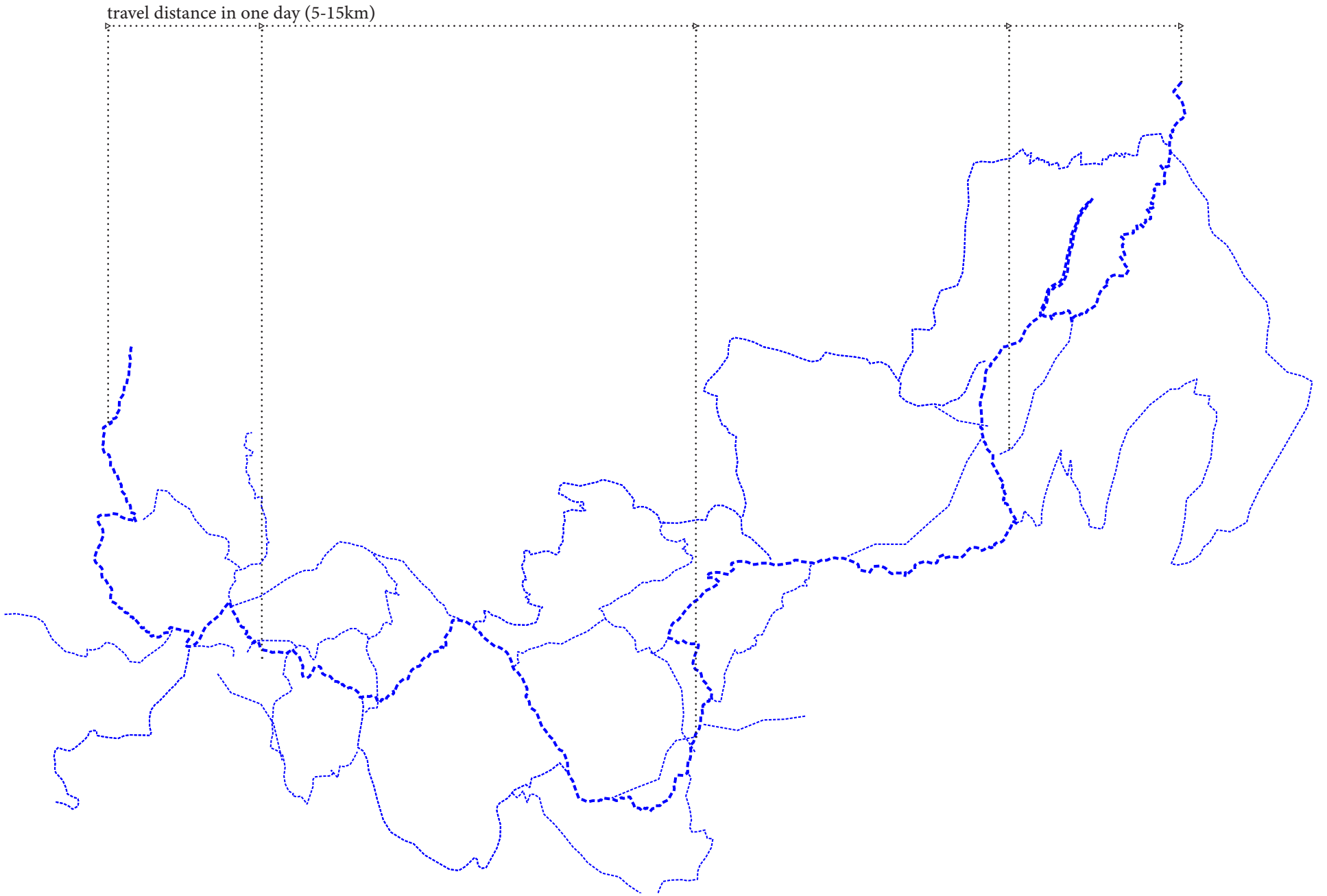
4th Night: approx. 1750m, Empty Storage Hut



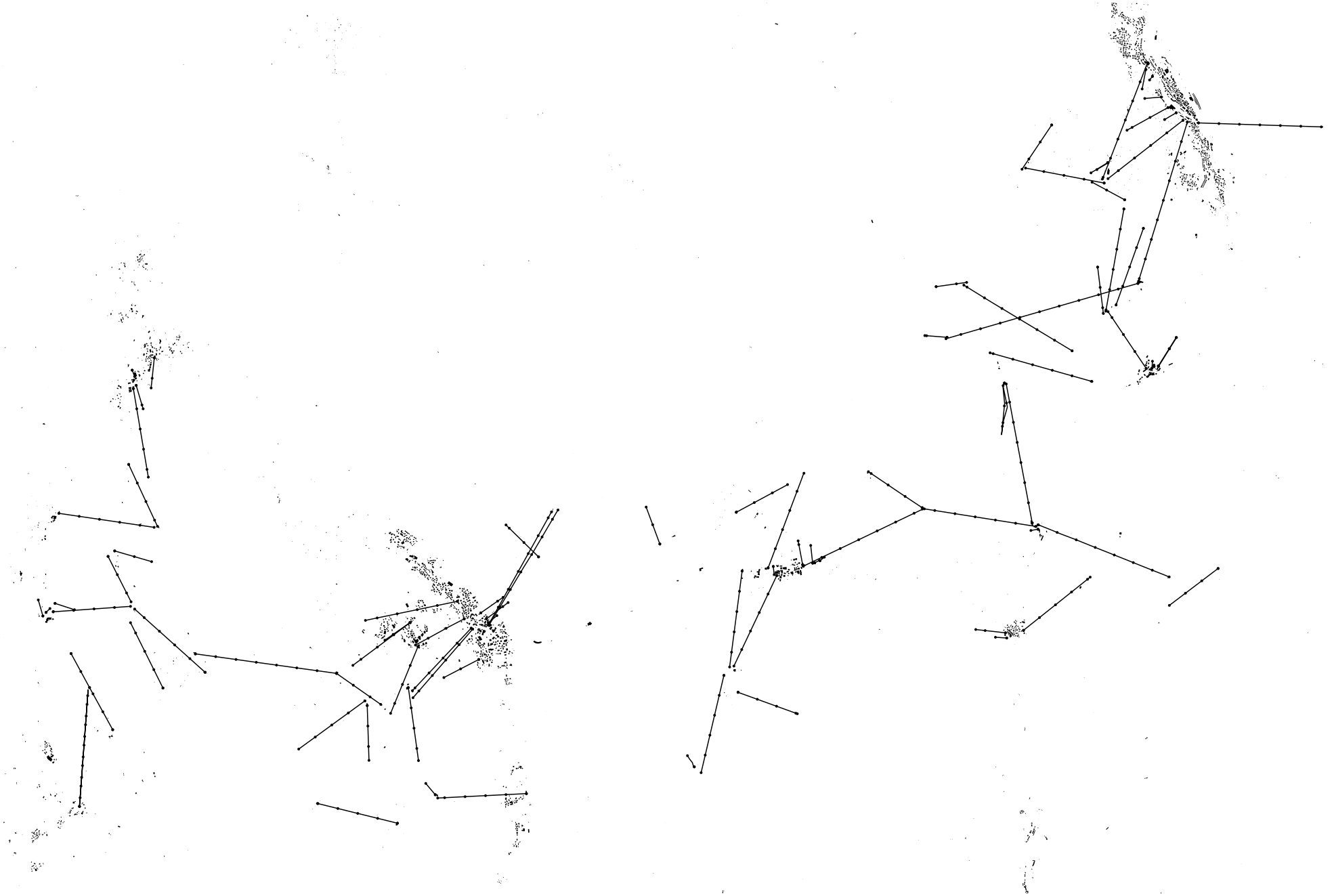
No-Snow Layers: Sleeping Places



No-Snow Layers: Altitude Range



No-Snow Layers: Hiking Paths



No-Snow Layers: Lifts

No-Snow Layers: Basemap [4]

En Route:
Snow Conditions

En Route: Snow Conditions

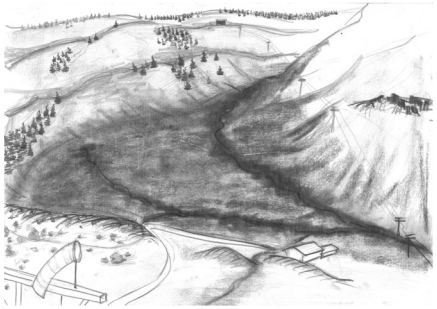
The selection of nodes is based on the following criteria:

Altitude. At each altitude, the landscape differs in vegetation, animal inhabitation, landscape objects, roughness, and machinery necessary to make skiing possible. In order to explore a sample of every possible type of landscape and infrastructure, the nodes are spread across a range of all altitudes.

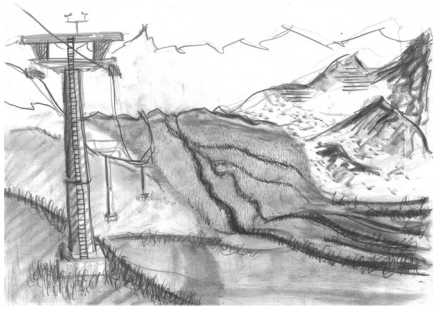
Infrastructure Density. The density of infrastructure is an indicator of how frequently a location is visited by skiers. Both the busy and less busy places are interesting to explore the impact of the presence vs. absence of infrastructure. There is also a connection between infrastructure density and altitude. While higher altitudes (where the terrain is rougher) often requires more infrastructure to make skiing possible, the lower areas are more relevant for snow-making systems and often have more and wider pistes.

Uniqueness. Rare elements like wetlands, lakes, or an alphuette might make one location quite different from another. Also unique parts of the machinery, e.g. something especially big might make a place more impressive in its experience than another. Both the unique and a sample of the 'more normal' landscapes are interesting for the exploration of the human / non-human relationships. The uniqueness might also me more apparant for one of the groups than for another.

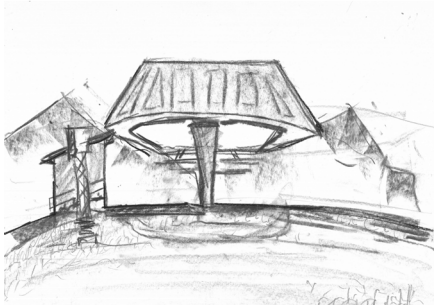
Of all the possible nodes, I chose 6 as a starting point for the research by design part to represent as many different types of landscapes as possible. All chosen nodes are roughly 200m in altitude apart from each other.



1650m

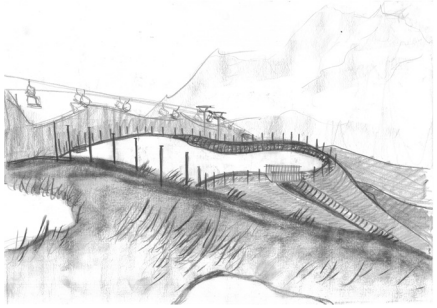


2100m



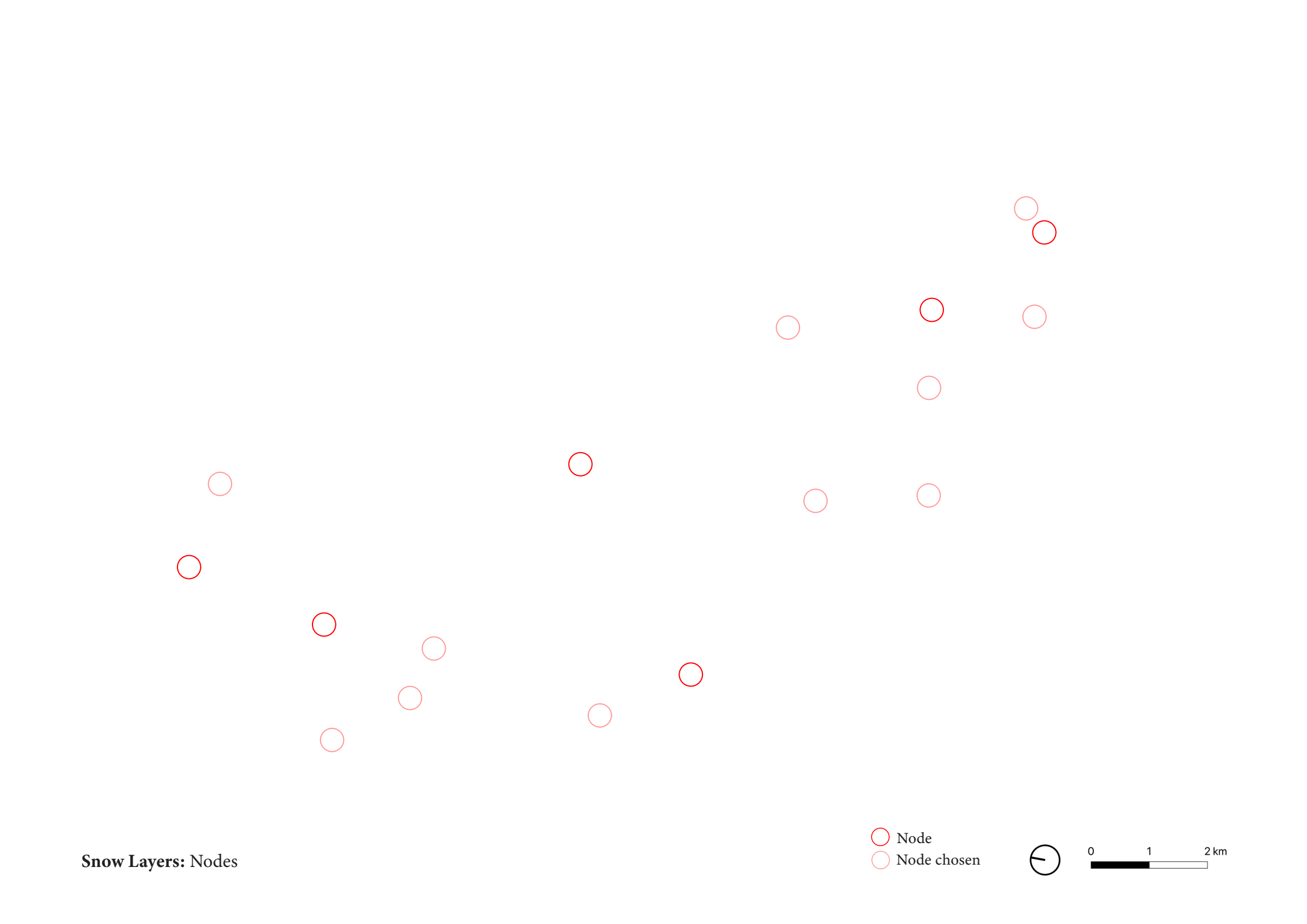
1854m

2304m

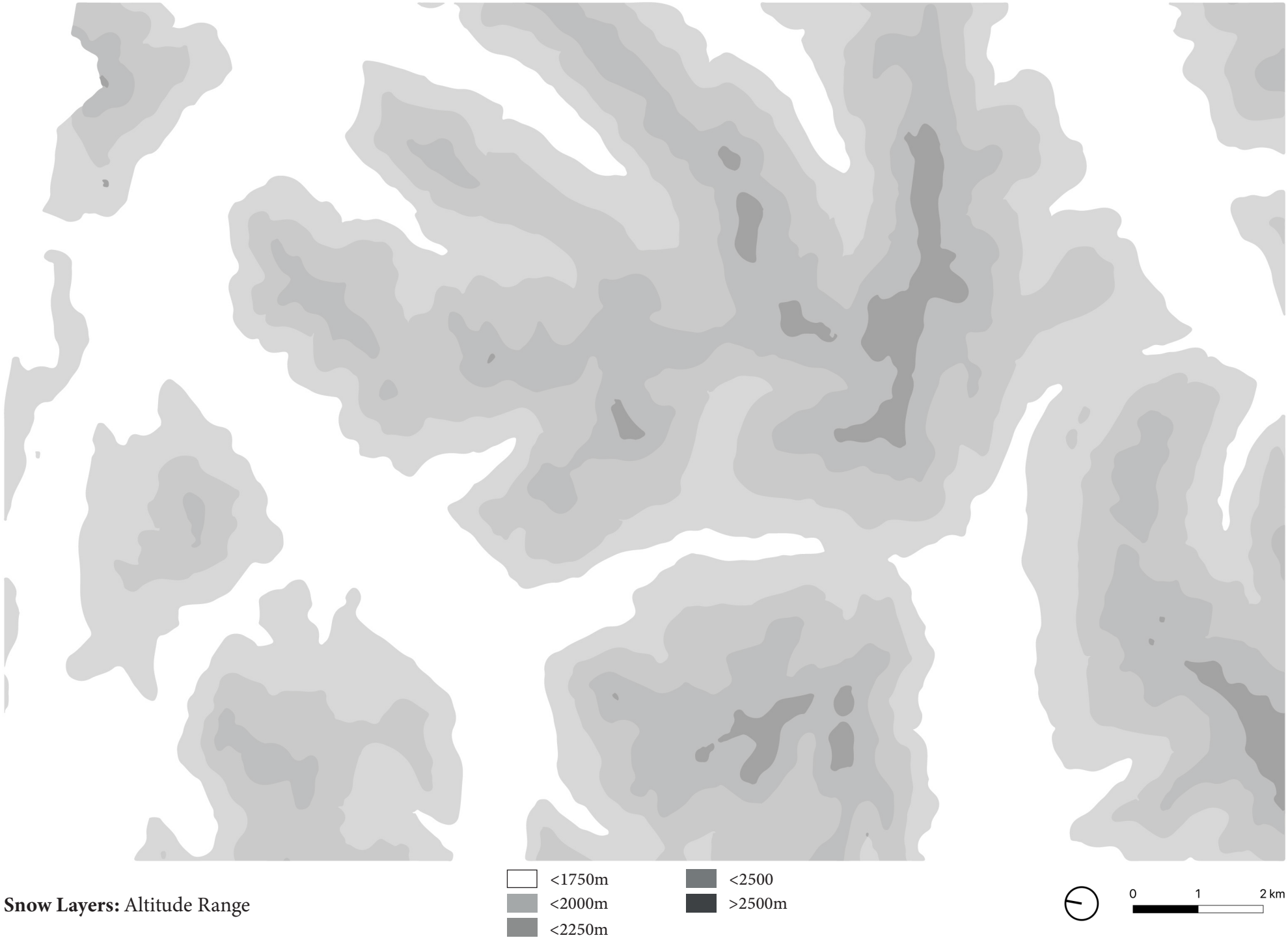


2018m

2579m



Snow Layers: Nodes



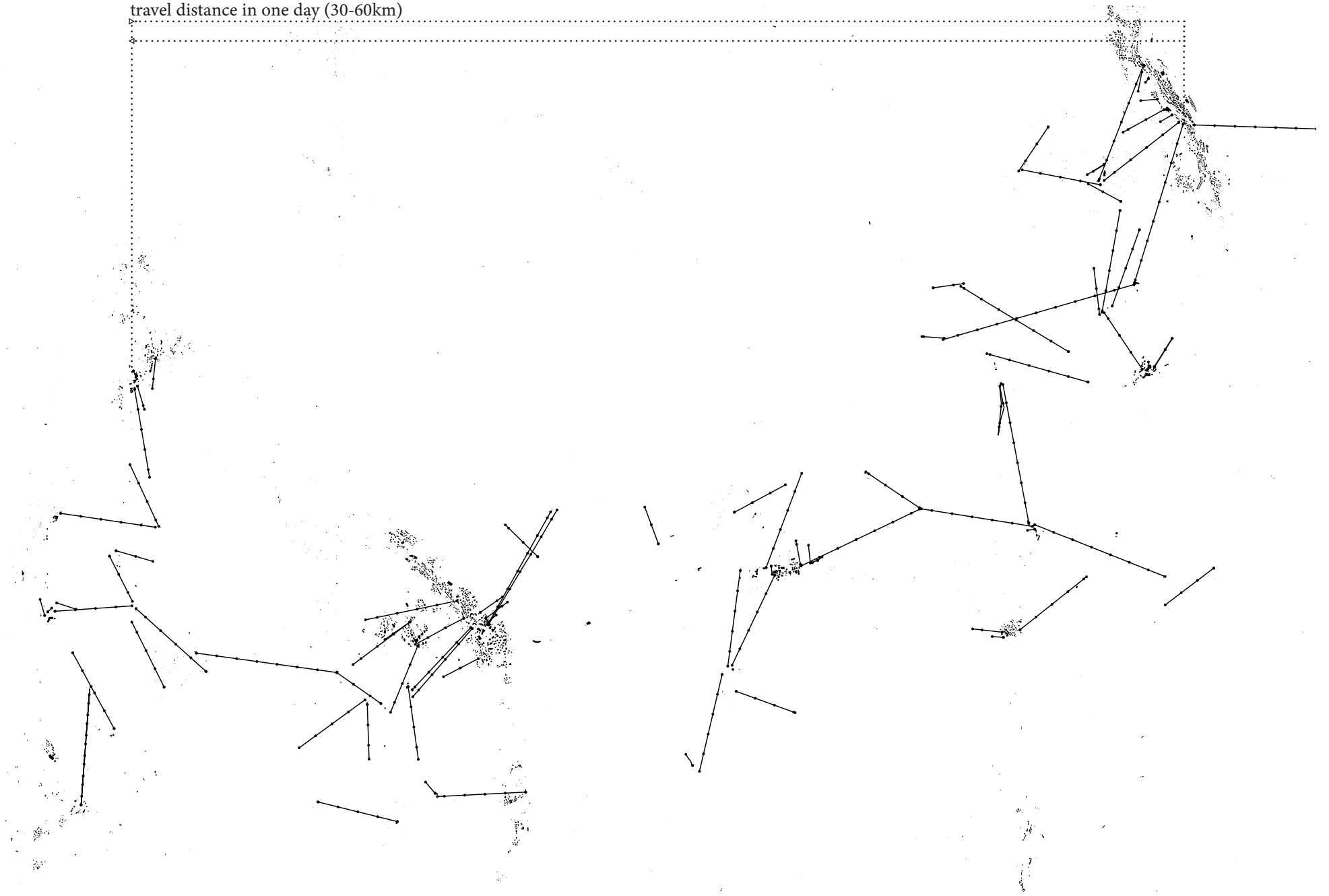
Snow Layers: Altitude Range

travel distance in one day (30-60km)

Piste

Snow Layers: Winter Path

0 1 2 km



Snow Layers: Winter Path

Snow Layers: Basemap [4]

Research by Design Framework

The final research question is *what are the most important factors when designing for humans and non-humans in a ski area?*

Many of the aspects that really show how we have seen ourselves as humans throught the past are immediately visible when hiking through a ski area without snow. The obsolete structures, the large scale re-shaping of the land, and the machinery right alongside the mountains without ski infrastructure are enough to see the human dominance and profit-above-all attitude. In snow conditions, however, many of those elements are invisible or less impressive because they are actively used during the winter period.

The research by design part explores the possibilities of positively impacting the experience of non-humans while making visible some of the entangled systems and narritives not visible to skiers in snow conditions.

The evaluation criteria are not tied to absolute scores, but they are rather a base for discussing the advantages and disadvantages of certain design actions. This discussion, subsequently, leads to relevant design paradigms. The design possibilites are evaluated using the following criteria:

Non-Human Animal Experience. Does the artwork destroy, hurt, or change an animal ecosystem? Does it create, protect or stimulate an animal ecosystem?

Plant Experience. Does the artwork destroy, hurt, or change a plant ecosystem? Does it create, protect or stimulate a plant ecosystem?

Human Animal Experience. Does the artwork destroy, hurt, or change a human animal ecosystem? Does it create, protect or stimulate an animal ecosystem?

Object Experience. Does the artwork destroy, damage, or change objects? Does it repurpose, reuse or recycle objects?

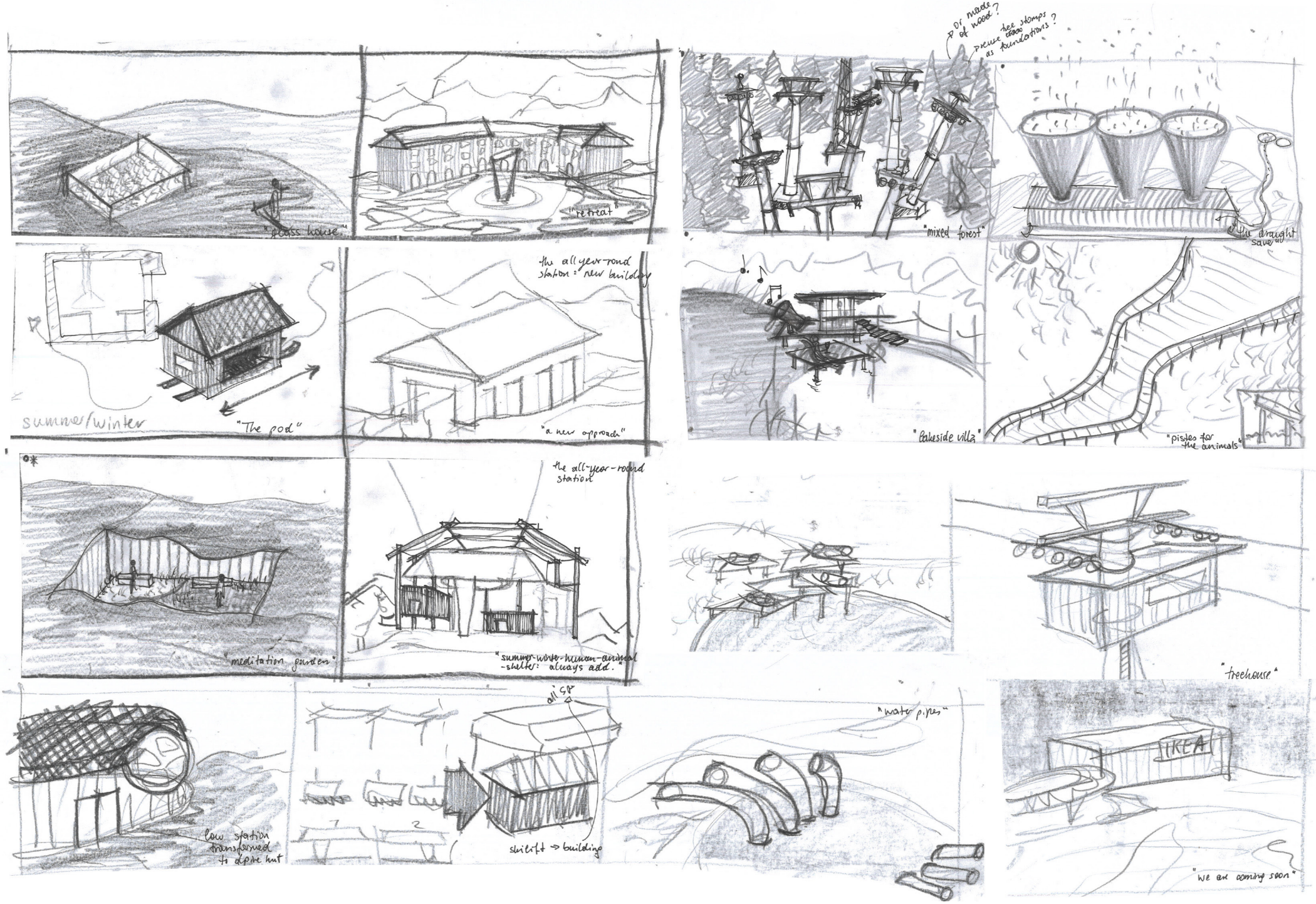
Impact over Time. What does the structure do in winter? What does it do in summer? What does it do in 50 years from now?

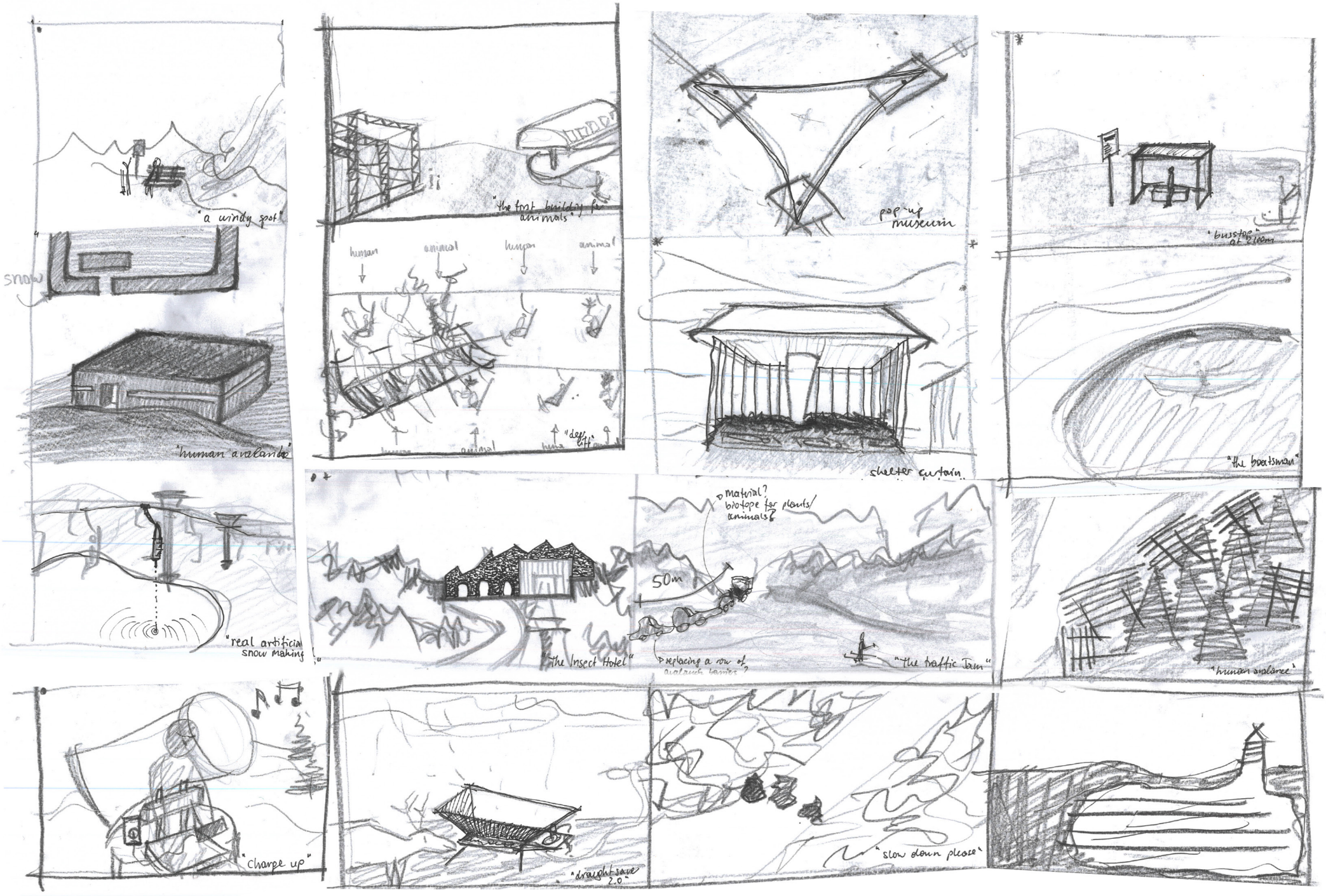
Stimulation of Thought. Does the intervention provoke thought in a visitor that might help with re-thinking the human role and position?

Energy Input. How much energy (embodied or newly-added) does it take to create the intervention?

The outcome of the exercise are conclusions about which aspects are important when designing for humans and non-humans in a (snowless) ski area. Six of the most thought-provoking possibilities are visualized as hypothetical designs, one for each chosen location. They communicate the entangled stories of machinery, humans, and non-humans and show some of the clashes of all actors in ski areas.

The following pages show the sketches produced during the research by design phase.


"glass house"
"retreat"
summer/winter
"The pod"
the all year-round station = new building
"a new approach"
"meditation garden"
the all-year-round station
"summer-winter-human-animal -shelter: always add."
"mixed forest"
"lakeside villa"
"pistes for the animals"
"treehouse"
"water pipes"
"we are coming soon"
IKEA
low station transformed to alpine hut
ski lift → building


"a windy spot"
snow
"human avalanche"
"real artificial snow making"
"the first building for animals"
human
animal
human
animal
"deer lift"
pop-up museum
shelter curtain
"busstop at bloom"
"the boatsman"
material? biotope for plants/ animals?
50m
replacing a row of
"the Insect Hotel"
"the traffic Jam"
"human avalanche"
"charge up"
"draught save 2.0"
"slow down please"

En Route:
Non-Humans and their ‘Hike’ Uphill

Interview with Nature Protection Expert

In order to gain some specific biology knowledge about alpine spaces and their nonhuman inhabitants, I met with a local nature protection expert. In exchange for an open and honest conversation that doesn't navigate around difficult political topics, I promised to anonymize our talk.

The interview was held in Vorarlbergerisch (a dialect of German). It was translated and edited to give an account of the most important thoughts and messages. If you are interested in detailed answers, questions, or specific words please contact the author.

How do you see the future of ski areas from a nature protection perspective?

If they don't reinvent themselves, they will have to close their gates. Ski areas are some of the first ones who are confronted with the changes of the climate. Not only because of a lack of snow, but also because of the high energy usage and a decreasing acceptance among people. The big danger is that the answer to less snow will be a plethora of new fast-paced activities that need even more surface area in the alpine landscape. Go-cart tracks, viewpoints for Instagram, summer sleighing, mountain biking; these are all activities where the lift is supposed to get you there but shouldn't be visually present. Therefore, they expand into the landscape away from the lift poles. It would be better to think about ways to sell the alpine experience without new buildings and "fast-food-tourism". I also think that the alps will become more and more popular for an increasing number of tourists – soon enough, no one will want a vacation house in Spain anymore because it will simply be too warm. The cooler high-altitude landscapes in the Alps seem a likely alternative. It is even more essential then to ask ourselves how we want to tackle this.

How relevant is the impact of skiing and ski area construction on the non-human world?

The direct impact is devastating: large areas that are planarized and 'corrected' with T.N.T. and bulldozers. Modern techniques have made this much better, with advanced machinery and specialized seed mixtures, but the pistes that were built during the 70s are still clearly visible today.
The indirect impact during operation of the ski area would be fairly limited if skiers were to strictly stay on the pistes. Unfortunately, the whole ski area has become a playground with everyone looking for thrills far beyond the boundaries of the official pistes. Additionally, initiatives like night-skiing and ski touring further reduce the calm periods for wildlife. The most important thing for the animals is that they have spatial and temporal opportunities to navigate around the touristic activities in the landscape.

How will the alpine landscape change as a consequence of global warming?

If you walk from the equator to the north pole, you encounter tropical rainforests, leaf forests, taiga areas, grasslands, and tundra zones.
In the Alps, this gradient takes place on a comparably tiny surface area through the different altitudes. This extremely high diversity in ecosystems on little land makes those landscapes even more vulnerable to climate change. Many of the highly specialized species in the Alps will go extinct. As the temperatures rise, more dominant and less specialized species are suddenly able to live at higher altitudes and drive away the specialized plants living there now. Those species resort to higher altitudes until they encounter an environment where they cannot survive and they die off. The result is a much more homogenous flora that, consequently, changes the make-up of the fauna as well.
An interesting thought is that the pistes with lots of artificially produced snow might be the last refuges for some specialized plants since the snow cover lasts much longer there – a bit like in a colder climate. This might be one of the many paradoxes that climate change brings.

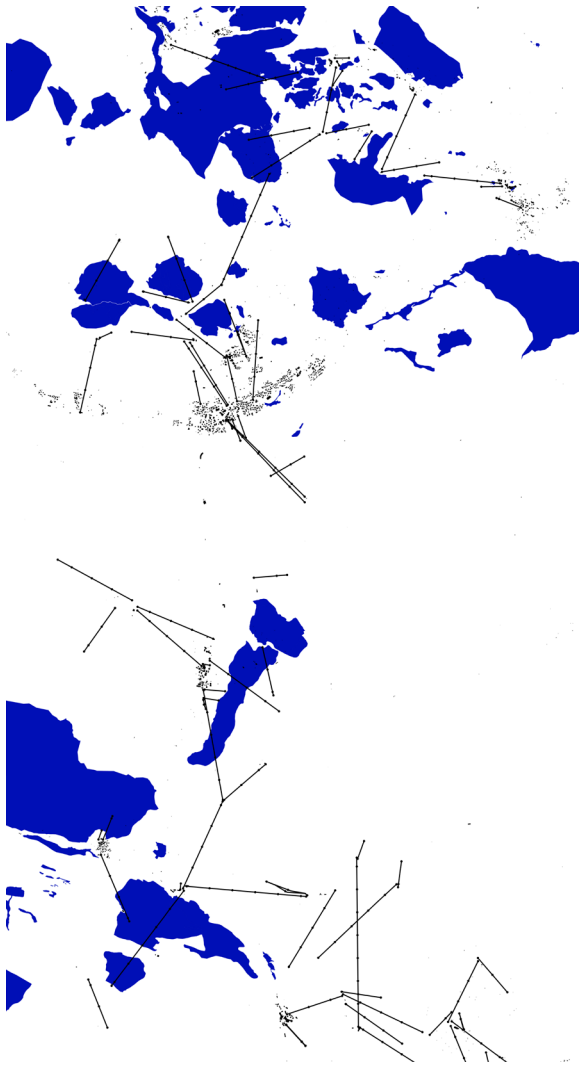
Does untouched nature still exist?

Really untouched nature is difficult to find in central Europe. Most ecosystems are anthropogenically coined, even the high-alpine ones. For example, the nitrogen levels in the air are so high that the entire alpine landscape is being fertilized by it – approximately equal to one agricultural fertilization per year. The human influence by itself, however, doesn't necessarily reduce the quality and functionality of an ecosystem or the need for its protection. Even anthropogenic environments like quarries can be extremely diverse and valuable biotopes.
Until the mid-19th century, many forests in Vorarlberg were "natural" with healthy amounts of dead wood and a high biodiversity. However, most of the region was forest and as a whole, there wasn't a large diversity in ecosystems. When humans created meadows and cut down some of the forests, the biodiversity exploded. A little disturbance in large ecosystems often boasts diversity – it's the boundaries between two types of biotopes that are especially interesting for many species. Today, however, the biodiversity decreases again. Larger scale, monocultural activities and agriculture limit the emergence of diverse species.

How do you decide which biotopes are worth protecting and conserving?

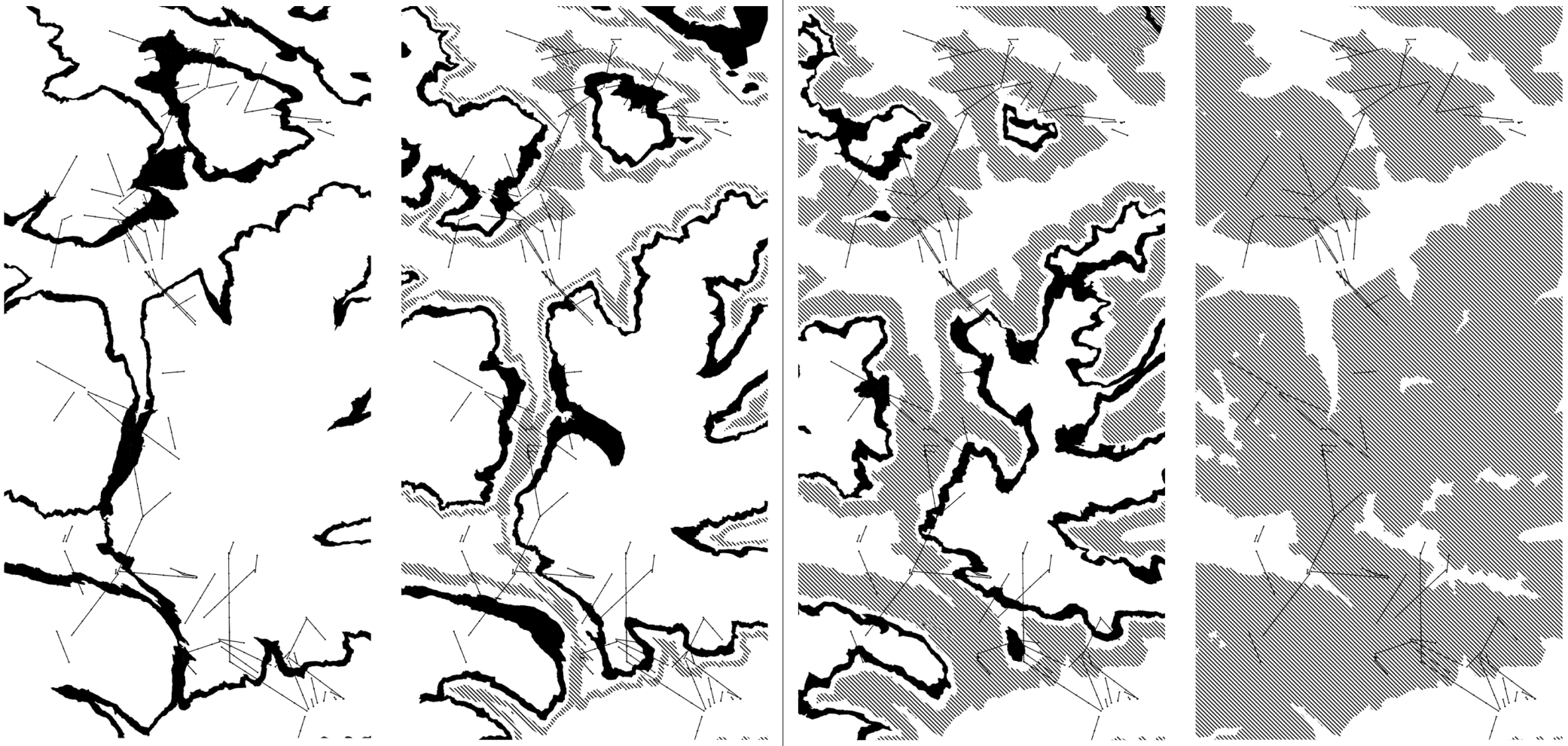
Generally speaking, for us, the main goal is to maximize the biodiversity. Since any patch of land that is left alone entirely will eventually turn into a beech forest, this also means cultivating and tending to some of the land – even if it's not strictly necessary for agricultural purposes.
Another important guide for us is the "precaution-principle". Often, the actual ecological consequence of a certain project or measure is nearly impossible to predict. Climate models are inaccurate and the relationships between ecosystems are highly complex. Therefore, if we

can't make useful predictions, we try to avoid doing anything at all.
In the end, nature protection is always a discussion about values: Do we want to preserve what we have? Do we want to try out new species like the Douglas fir or robinia? How important is the agricultural heritage?



protected biotopes
in ski area [5]

time (progressing climate change)



dominant vegetation (less specialized)

specialized vegetation

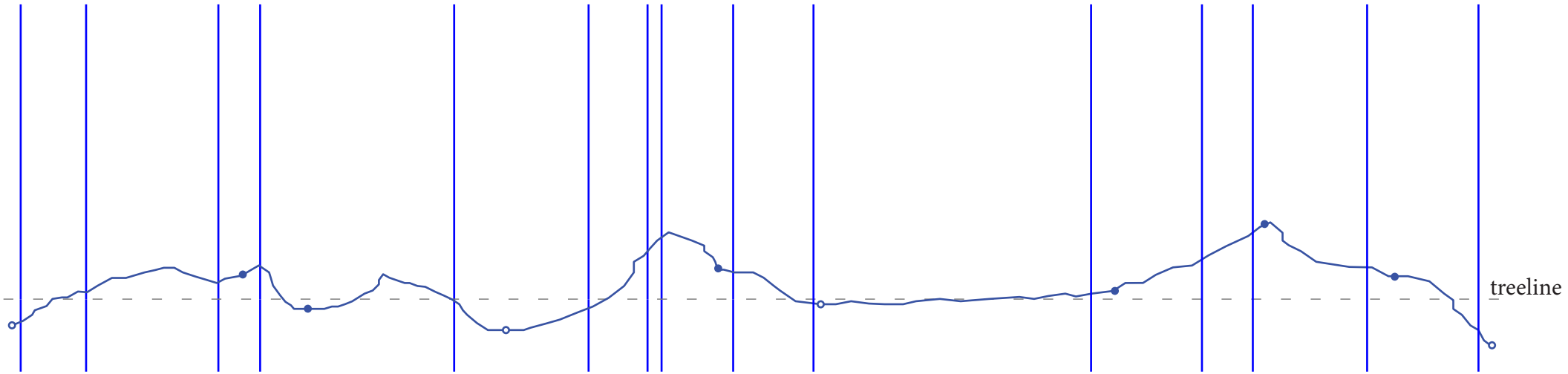
Uphill Movement Specialized Vegetation

Treeline Throughout Time: Projected Upwards Movement in the Future (2100m)

Treeline Throughout Time: Before Human Settlement (1900m)

Treeline Throughout Time: Present Day (1700m)

Treeline Throughout Time: Basemap [4]


treeline

Endnotes

1 René van der Velde, "Transformation in Composition. Ecdysis of Landscape Architecture through the Brownfield Park Project 1975-2015." (PhD Delft University of Technology, 2018).

2 Elissa Rosenberg, ed., Gardens, Landscape, Nature: Duisburg-Nord, Germany, Trash. Alphabet City Series. (Cambridge: MIT Press, 2009).