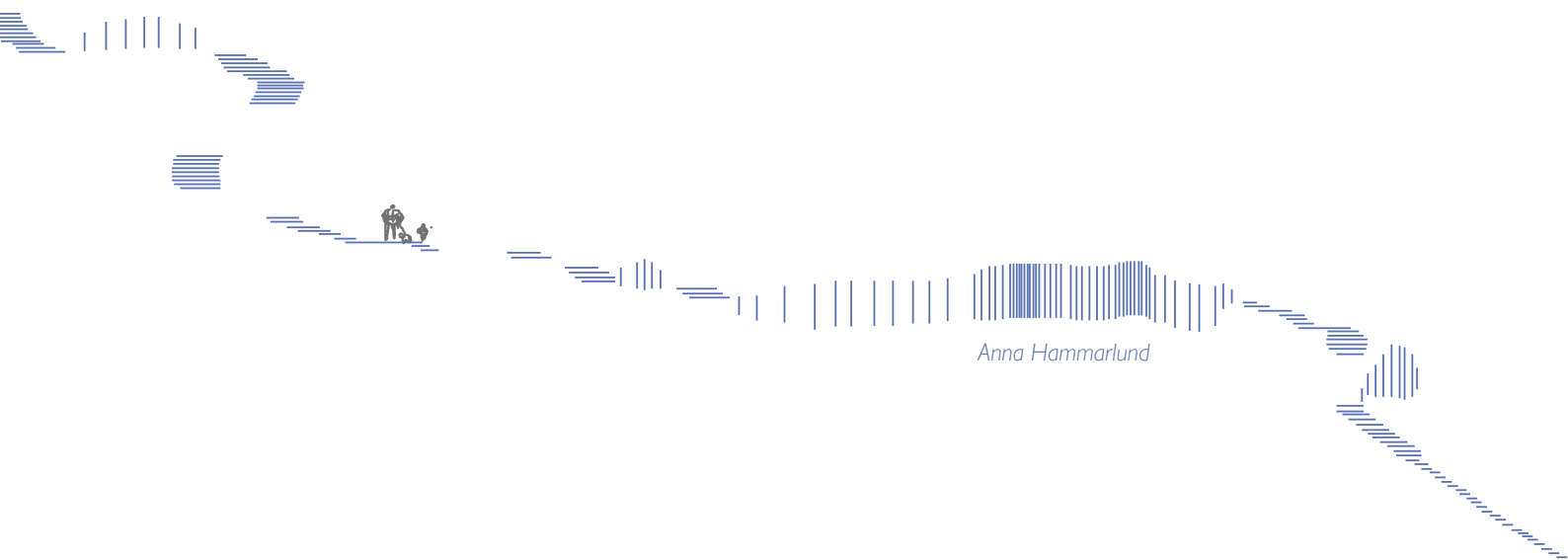


Fjällens Rörelsearv

Movement Heritage of the Swedish Mountains



Anna Hammarlund

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Abstract

The fjäll*-landscapes are debated areas in Sweden. Within these districts there are varying interests by different actors. The goal is, according to Naturvårdsverket and Länsstyrelsen (2018), to preserve fjällen the way that it is.

If one looks at how humans have used the landscape historically, it is defined by movement. The remnants from humans are in general small, and usually in shapes of trails and paths. These traces do not make much impact on nature. (KTH 2015)

Groups with different interests in fjällen have managed to co-exist without too many conflicts; samis, reindeers, small scale tourism and researchers have all used the area without leaving anything but "discrete monuments" '. These monuments are what is presented as the movement heritage. (KTH 2015)

One can be inspired by this sustainable way of using the mountain landscape. By promoting the movement heritage, preservation and care of the area might increase. (KTH 2015)

This thesis explores how architecture can contribute to do so through mapping of the situation in the mountains, art studies, literature studies and exploration of movement, nature and culture.

The graphic material in this thesis can give a deeper understanding of the term movement heritage as well as showing the historical and natural values of the mountain landscapes.

An architectural addition could help to promote important spaces found within the movement heritage and thereby contribute to give ideas of how to use the landscape in a sustainable and respectful way.

The design proposal is an infrastructural element that provides safety, visibility of the path and efficiency in a functional and aesthetically pleasing way. At the same time it enhances cultural aspects and natural effects through architectural elements and spatial effects. The "augmented trail" is a segment of a walking path and is enhanced by the, in fjällen, commonly used footbridge plank.

* Fjäll is a definition used in the scandinavian languages that explains a mountain or a hill which has a part above the treeline

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INTRODUCTION



View of Tolpagorgni and footbridge, Kebnekaise area

Background

Fjällen

The Swedish mountain landscape is of great importance, both culturally, ecologically and economically. It includes a large natural- and cultural heritage. It is a landscape of mobility, strongly affecting the culture within it, why the term movement heritage is used. (KTH 2015)

The mountain areas and the use of them are often debated. (Tidholm 2014) The landscape is threatened by climate change and exploitation and the culture is often overlooked. (Edblom 2021)

Today, the protection and preservation of the mountains and its cultural heritage are mainly limited to national parks and specified protection areas. Because of this many important traces and values have not been put in focus. The development opportunities are left unutilized. (KTH 2015)

Aim

Protect, Preserve, Promote

KTH (2015), who have stated the concept of the movement heritage (see theory), have specified aims within the field:

1. To understand how the mountain landscape, its discreet infrastructure and the image of it have formed the movement heritage.
2. By giving a nuanced articulation of this heritage, increase the status of the mountain landscape and update preservation ideas.
3. Through collaboration between cultural conservation, nature conservation and the different actors in the mountain landscape (museums, sports, outdoor activities, tourist organizations- and companies) develop ideas concerning common use and preservation of the spaces and environments within the movement heritage.

The hypothesis of the thesis is that architecture has great potential in helping reach these three aims.

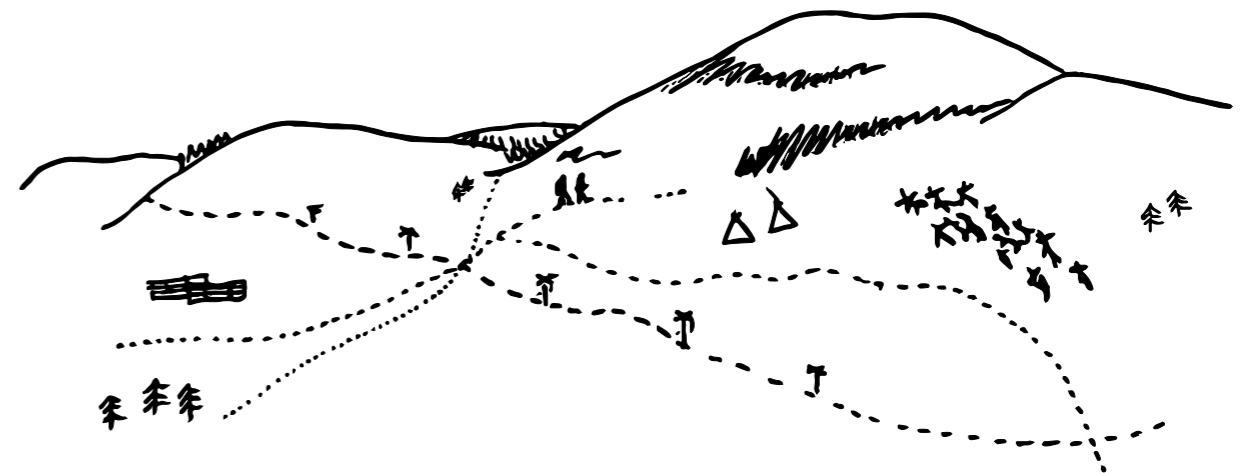
Architectural Contribution

As the landscape and culture today seem to be a non priority, one can argue that the landscape in itself does not explain its values well enough.

The thesis is driven by the argument that human designed features can enhance the experience of the landscape and educate about the culture. The design in the thesis will work with all three aims specified by KTH, but most focus is put on the first (pt. 1) and second one (pt. 2).

Thesis Question

How can architecture help to promote and preserve the movement heritage in fjällen?

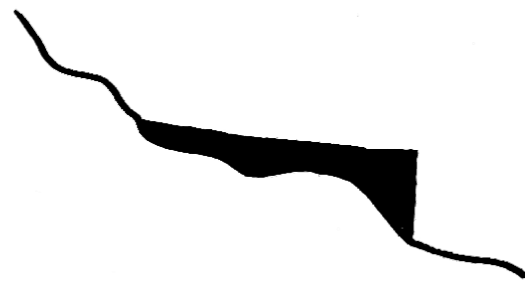


Purpose

The Power of Design

The purpose of the thesis is to explore how human built structures and design can enhance the experience of moving, nature and culture - the movement heritage. In this thesis following architectural strategies are used to do so:

- Explain the movement heritage from an architectural point of view
- Use the architecture as a tool to enhance the experience



and educate about the mountain cultural landscape

- With a design concept articulate spaces where the movement heritage is present

Method And Process

Theory

The concept of movement heritage is stated by researchers from KTH for the preservation project "Storslagna Fjäll" by Naturvårdsverket. The report from the project has built the foundation of this thesis.

The lifestyle of the different actors in the mountain areas have been studied in literature, film and art references. The act of moving/walking have been studied in art and literature references, this to understand how a landscape of mobility is perceived.

Further on photograph studies, maps and literature, have been studied to find what human remnants there are and what architectural elements have been used in the Swedish mountains.

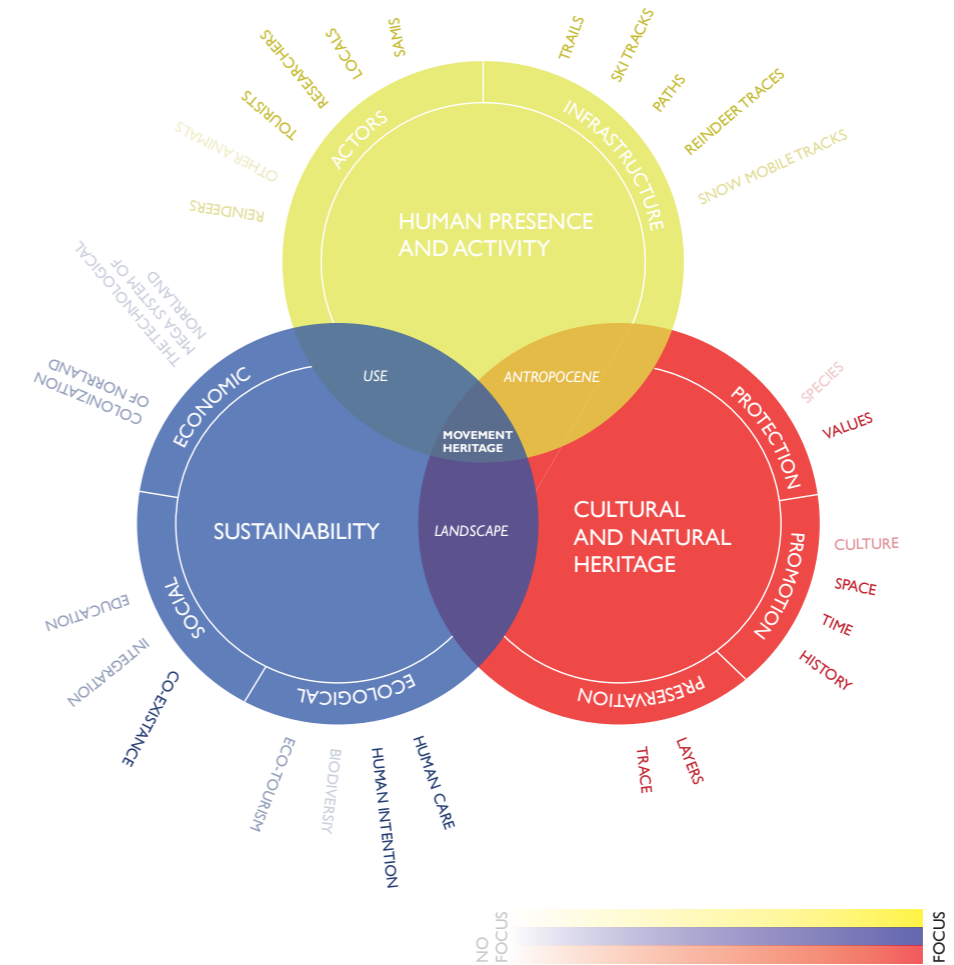
Design methods

Documentations and illustrations of different spatial effects and phenomena of the mountain landscape are presented. This to explore spatial experiences of fjällen and its influence on the culture. They are based on their own experiences and observations.

Human built additions and their behavior in the mountain landscape are explored through design studies to understand the culture and its connection to moving and landscape.

The theory and design research are used as base for a design proposal where the goal is to connect back to the landscape, movement and culture.

Delimitation diagram



Delimitations

About / Not About

This thesis is about the concept of movement heritage which covers a large area of Sweden. The thesis focuses on general aspects of this area and does not go into detail on the variations of the landscape and culture. A site is used as a demonstration of a context but should be seen as conceptual.

The design is connected and inspired by landart which is why it can be seen as an art installation rather than a regular infrastructural element / building. Accessibility and safety rules have therefore not been fully followed.

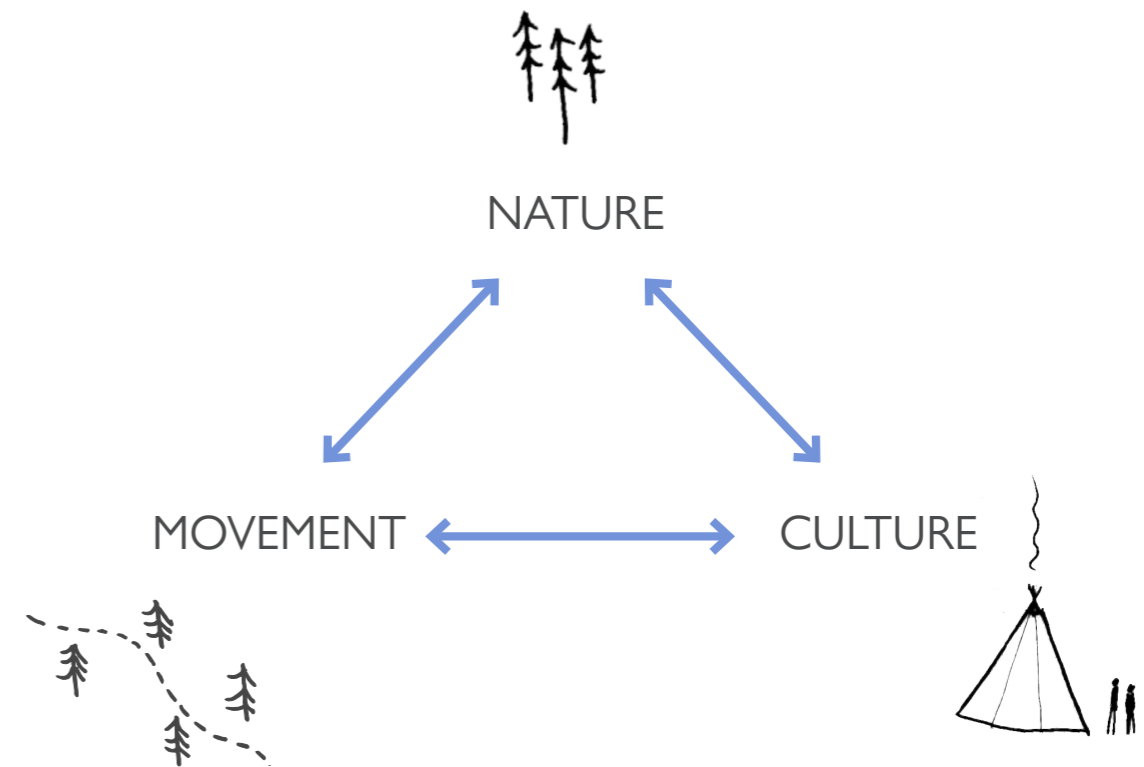
The thesis brings up the indigenous people of northern Sweden (Sami) and their culture. One should know that these people have been oppressed for a long time. This is

an important subject but not the main focus in the thesis. The focus lies on the concept of movement heritage. The project aims to benefit and promote Sami culture among other things.

The design proposal is part of the "augmented trail", the idea is that the trail can be augmented in many places to enhance different sorts of environments and articulate different cultural spaces. Due to time limitation only one situation is developed into a design.

PT 1.

Study of Fjällen: Culture and Nature

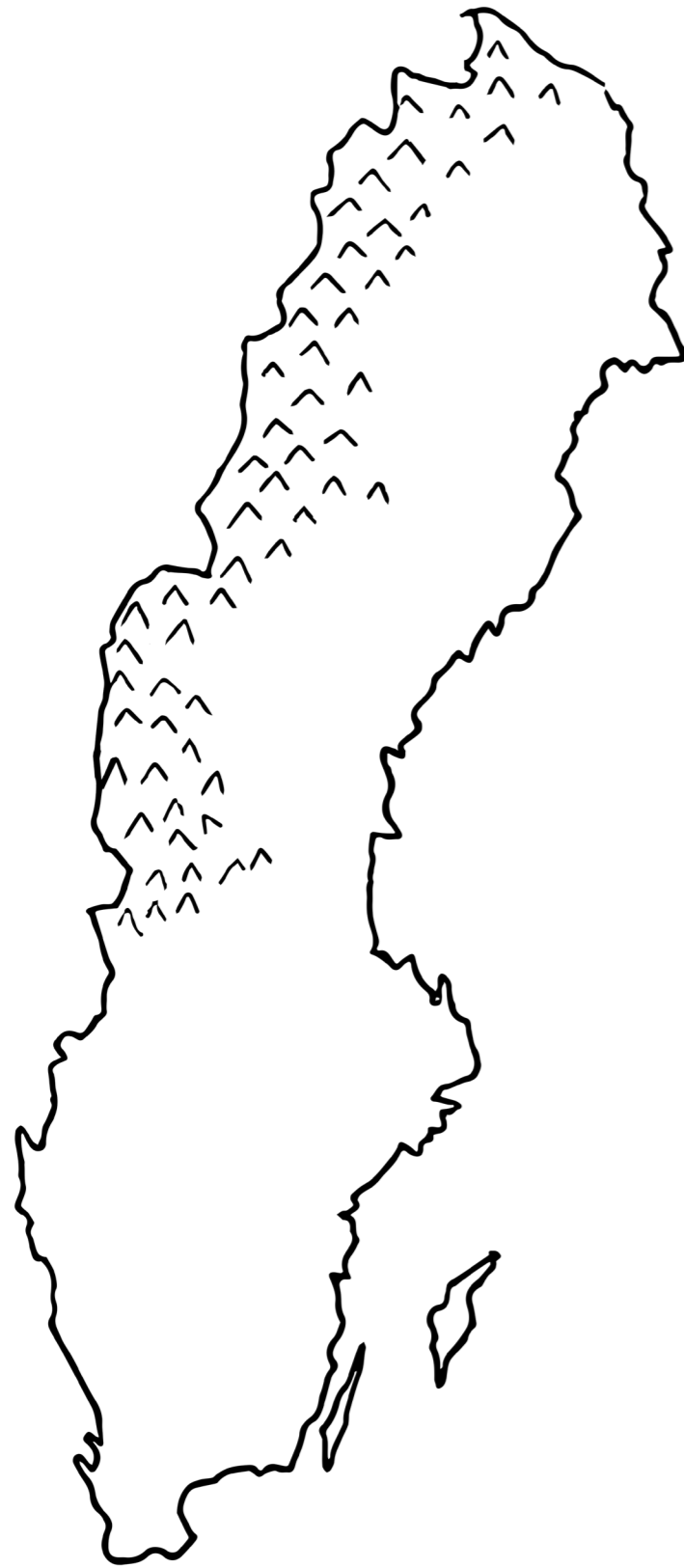


About PT. 1

Fjällen is a complex area where nature, culture and movement engage and become a rich cultural landscape. In this chapter these three concepts and the connections between them are investigated and explained.

It starts with an introduction of the area, the culture and how it is connected to mobility, followed by a deeper explanation of the movement heritage, human trace and studies of nature. The studies and analyses are then summarized in diagrams to explain the relationship between nature, culture and movement and to form ideas on how design could benefit the area.

Introducing Fjällen



The Scandes

Fjällen is situated in the north-western part of Sweden. The mountain chain is named the Scandes and covers a large part of Norway and a bit of Finland as well. The Scandes have their own specific features and compared to other mountain chains in the world, the peaks are quite low.

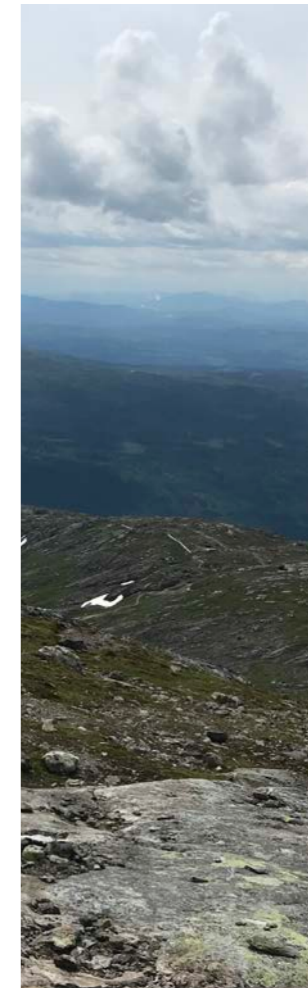
As the mountain landscape stretches from the middle to the north of Sweden, over different climate zones, the characteristics of fjällen vary a lot. Despite this there are a lot of similarities throughout this area of Sweden.



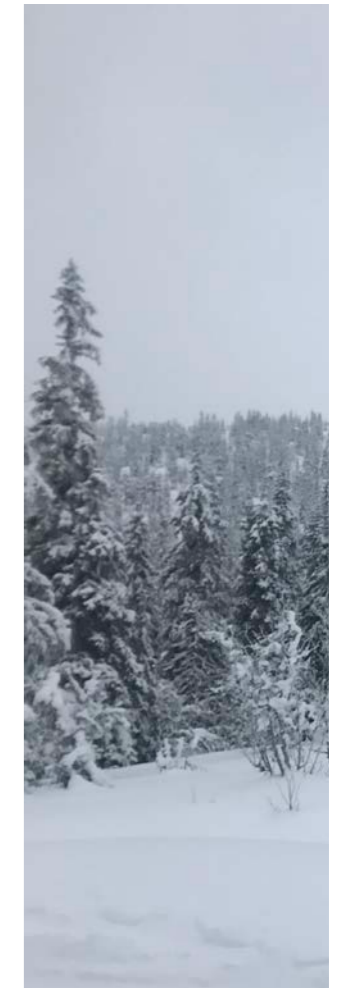
Tarfala



Västra Kalven



Tväråvalvet



Högfjället

The Nature

The nature in fjällen can be both stunning and intimidating but at the same time very low-key and almost melancholic.

The topography offers a large variation of landscape types, flora and fauna.

In the southern part of the mountain chain, the mountains have the characteristic rounded shapes while in the northern part they are more craggy.

Vegetation and especially the trees are often slender because of the lack of sunlight.

The seasons of the year shift powerfully and have a strong impact on the scenery. The weather is always present and influences one's impression of the landscape.

Fjällen - A Cultural Space

A common mistake is to think of the fjäll-landscape as an unused territory. The fact is that fjällen has been inhabited and used by humans for centuries. The humans that have been moving in fjällen come from different backgrounds and their operations in the landscape are different.



Samis
The Indigenous people of Northern Scandinavia, going back around 3500 years. They are known for reindeer herding, but have also pursued other livelihoods. There are many mobility remnants from the Samis in the mountain landscape, especially since many of them have lived a semi nomadic lifestyle. (samer.se, n. d.)



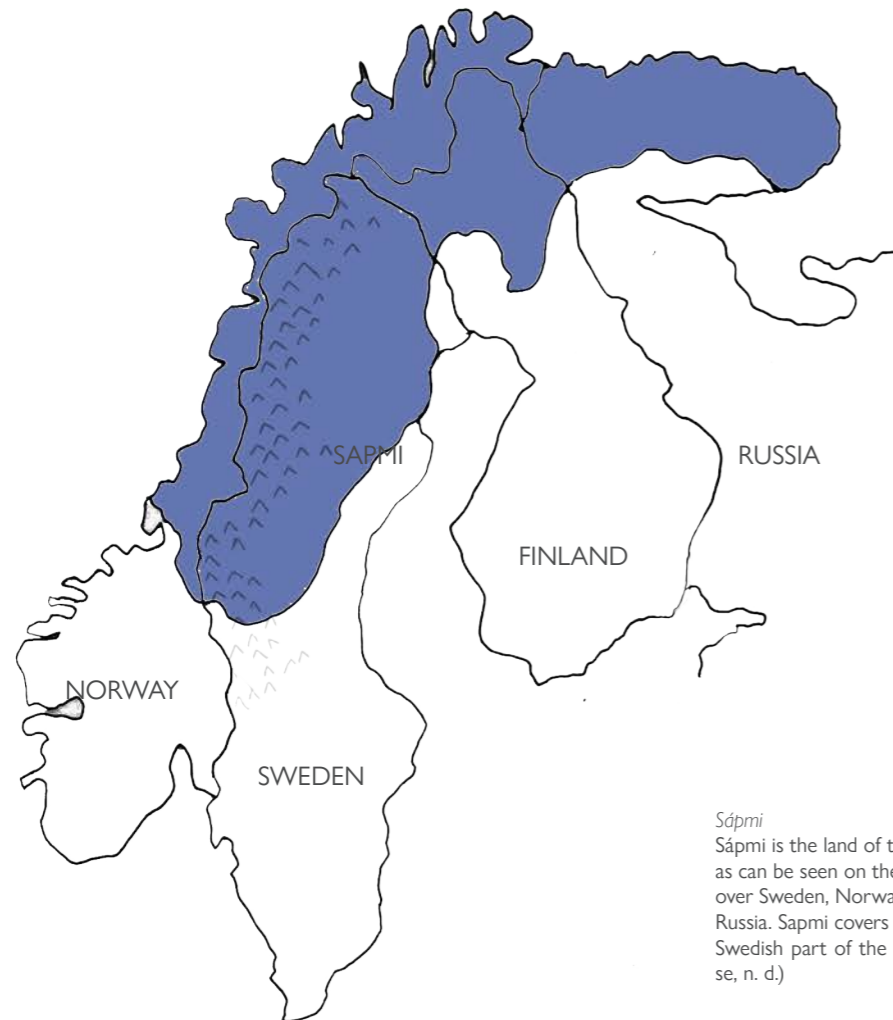
Tourists
Sweden has quite a long history of outdoor tourism. People have traveled to the mountain areas to enjoy the fresh air, views and nature while doing activities such as hiking and skiing. In some parts this started over 200 years ago. (STF, n. d.)



Researches
The mountains and their off-grid areas have attracted researchers in the past and still do. These landscapes offer interesting climate and nature phenomenons as well as various species. (KTH, 2015)



Locals
People living from and by the mountains have formed societies of various sizes. (KTH, 2015)



Sápmi
Sápmi is the land of the Samis which, as can be seen on the map stretches over Sweden, Norway, Finland and Russia. Sapmi covers almost all of the Swedish part of the Scandes. (samer.se, n. d.)

The Battle of the North

According to Naturvårdsverket (2018), the goal is to keep fjällen in its existing shape, valuing and protecting its nature and culture. But there are a lot of conflicts in these parts of Sweden. One often talks about the "colonization of Norrland", where national interests such as the mines, forestry, power plants etc. have been and are prioritized in terms of landscape use. This has led to issues both socially, ecologically and economically. By promoting other aspects of the northern landscapes, it might contribute to a more considerate use of land. (Tidholm, 2014)

The indigenous people, the Samis, who have a long history of using the mountain landscape in Sweden have been oppressed, and still are in many ways. (Edblom, 2021) One can argue that this must be considered when discussing northern Sweden, and hopefully, by discussing and promoting

the landscape of mobility in the mountains, the Sami culture can be promoted and valued.

Tourism is a hot topic within the sustainability field. When tourism is too extensive it can be considered a threat to the sustainability goals. (Naturvårdsverket, 2018) This project aims to find a balance where tourism does not interfere too much with the existing culture and nature.

In the landscapes where reindeer, samis, researchers and tourists have co-existed in a smaller extent – it has worked quite well historically. (KTH, 2015) This is something one can gain knowledge from and use as an inspiration in the future. If educating about movement heritage human care and intention might become more benign.

A Culture of Mobility

Why move?

One has to move through the landscape of fjällen to understand it, states the article by KTH (2015). In a landscape that is ever changing; by season, topography, climate and so on, one can argue that staying in one place will not give a full understanding of this space. To see how the different areas affect each other has been proven valuable for humans, one knows how to make the most out of the different landscape types and what individual benefits they offer. (Löfroth, 2021)

The landscape itself seems to even demand relocation. For example, weather might cause one to seek shelter in the woods. A location which is a great campsite in summer can be inhabitable in winter. One might need to get to a peak to get an overview of a situation, such as where to find the reindeers or to measure natural phenomenon. (Löfroth, 2021)



Lapp cot in Borgafjäll, old Sami residence

Temporary Residences and Portable Homes

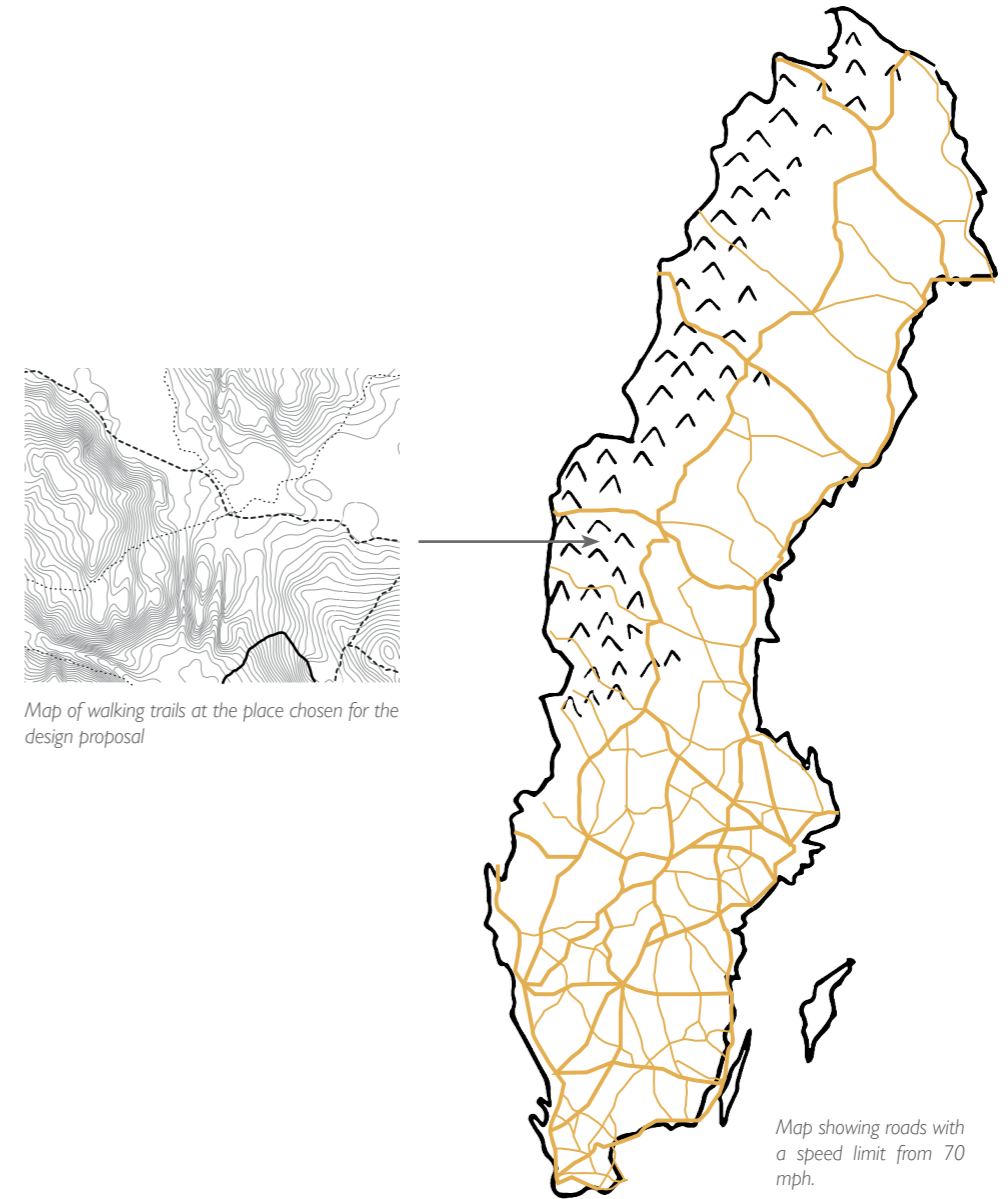
One aspect of movement culture is the temporality of habitation. As both Marakatt-Labba (Trosell, 2019) shows in her art piece "Historia" and Labba (2020) mention in her book, the Samis have lived a semi-nomadic lifestyle in the past. Small traces of temporary residential sites, like changes in the vegetation from where lap cots have been raised and burnt ground from the fireplaces, can be found. (KTH 2015)

The Sami artist Nango (2022) also stresses the temporality and mobility of the Sami culture. He travels around in a van called the Girjegumpi and brings a mobile library and exhibition. Nango (2022) also explains that because of this moving lifestyle, vernacular design has been the common way to construct homes and complimentary building. In order to travel light the Samis only brought the most necessary components and used what was found in the nature housing constructions and other designs. Nango (2022) have mapped this behaviour also being common today in the sami culture, which can be seen in his piece "Vernacular" in his digital exhibition Gumpi Space.

The tourist culture in fjällen have a similar behaviour. Tourists in fjällen often reside in portable homes: tents and campervans (STF, n. d.). There are also wind shields that are more permanent constructions; wind shields - both pre-constructed and man made ones, where one can stay for the night before traveling further. STF have cabins strategically placed so that tourists can walk in between them.

To study nature and climate phenomenon, researchers have research stations spread out across fjällen, where they reside occasionally. (KTH 2015)

Temporary tourist campsite in the Nikkaluokta area.



Map of walking trails at the place chosen for the design proposal

Map showing roads with a speed limit from 70 mph.

Travelling non Motorized

As can be seen on the map; in the larger part of fjällen there are not a lot of larger motorized roads compared to the rest of the country. However the area is not at all free from human infrastructure, instead there is a network of trails and paths of human scale. This argues that the common way of traveling through the area is by foot or skis as most motorized vehicles would be hard to drive on these small multi-terrain paths. Some vehicles suited for the terrain occur in the area, such as snowmobiles and ATV:s.

What also argues for walking being the main way of moving through the mountains is the history of the Sami's seasonal nomadic lifestyle. In a video about her artwork "Historia", Britta Marakatt-Labba (Trosell, 2019) explains how the Sami people travel from mountain areas to cultivation or sea areas, winter and summer land, and when doing so the pace is adjusted to the pace of the reindeer.

The tourism activities in fjällen are in themselves often activities of moving; hiking, skiing, biking and snowmobiling. (KTH 2015)

The Movement Heritage

Historically humans have left little trace in the mountain landscapes in Sweden, but there are a few discreet monuments showing past and present human activity. This can be considered to be of cultural value.



Mire, Glommerträsk

What is movement heritage and what does it do?

The movement heritage is formed by different actors. It can be considered a neglected cultural- and natural heritage. It can consist of, for example: trails, cross country ski trails, paths, lapp cots and skiljningsplats (reindeer-separation). These are discrete infrastructures and by forming a (mental?) image of these, they can act as a movement heritage. (KTH 2015)

By becoming a movement heritage the status of the Swedish mountain landscape can increase and thereby update preservation ideas. (KTH 2015)

The immaterial cultural heritage and spatial rootedness in fjällen, such as jojk, songs, music and poetry are connected to the movement in these mountains. This means that the movement heritage would also benefit the immaterial culture. (KTH 2015)

A cultural heritage does not have to be a salient building. It

can be something more unspecific, but nevertheless valuable, such as the traces of mobility. Movements that exist and have existed in the past can tell us a lot about the culture and history in the Swedish mountain chains. (KTH 2015)

KTH (2015) mentions that when having discussed the movement heritage concept with people that live and act in the mountain areas, these people understand the essence of the term.

Why is movement heritage important?

To understand the mountain landscape one has to move through it. Therefore it is important to pay attention to remnants the traveling through has created. (KTH 2015)

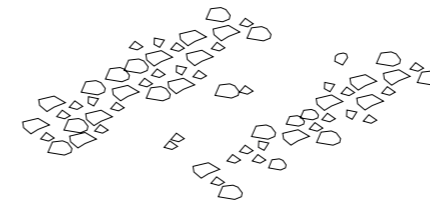
This will enhance the understanding of history, culture and nature. Trails can be seen as knowledge tracks. (KTH 2015)

Human Trace

The trail - Commonly used paths

The trail is formed by walking and moving through the landscape - a trace of human nature that is not designed, instead it is unconsciously shaped. The trail is a huge part of the natural system and culturally of great importance as it can tell us where people move and have moved in the past.

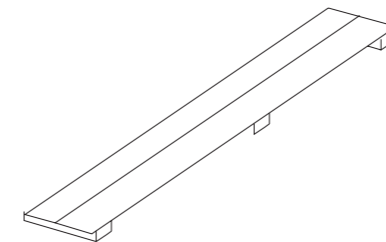
The trails contribute to the understanding of landscape use and appearance. The landscape is a configuration of vegetation and lack of vegetation. Traces of movement are visible as the vegetation will not grow when it is constantly being stepped down. These are obvious clues on where human and animal have moved and will tell us where it is best to do so.



The footbridge - Wetness prevention / vegetation protection

Built by humans, and for humans: to make walking accessible in certain areas but also to prevent further human damage. It is a human element in nature which is beneficial for both.

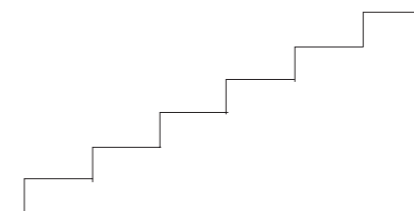
It is found in certain natural landscapes. It is put on trails where humans tend to move a lot - meaning that these places are important human space in fjällen.



Steps and Footbridges - Safety Installations

The steps are built to make walking accessible, easier and safer. They are changing the configuration of the landscape perception. They are put up in those spaces where people have been moving a lot and might have been injured OR to make a space accessible to walk in.

They can tell us where people move and have moved in the past, they can also tell where accidents have occurred. They make it easier for one to move around and contribute to making it possible to reach places one has not reached before.



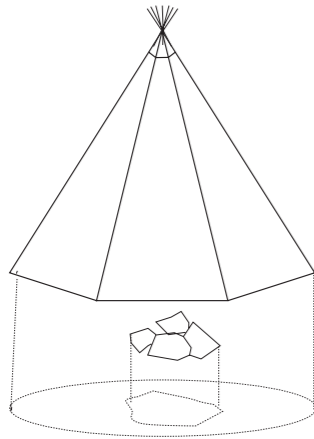


Cross Signposts - Finding path in snow and bad visibility

The cross signposts are built by humans, and for humans: to be able to orient when trails are not visible because of snow or bad visibility. They enhance the perception of the trail.

The cross signposts contribute to the understanding of landscape use and appearance by making trails visible from a larger distance. By their verticality and distinction one might be able to overview how to best move through a landscape and thereby be able to guess why.

Habitat, Tent Plots and Fire herds - Where human have resided



As the Samis were a semi nomadic people, large buildings were not built in fjällen in the past, instead only small traces of inhabited spaces are left. The same thing goes for moving tourists who have been sleeping in tents, leaving (hopefully) only small marks.

Sometimes, smaller constructions of local material are built, especially in the more recent times. These structures provide residency on a basic level in forms of cots and wind shelters. They are low maintenance and if left unused they would naturally decay and merge with nature.

The spots where samis and others have resided in tents are often strategically chosen and can educate about the nomadic lifestyle.

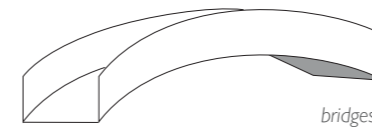
Hole in Ground - Animal trap



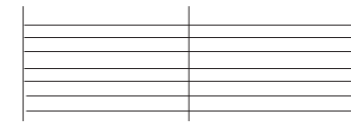
The animal traps are holes dug by human. Often in a thought-out system of several traps. They are strategically put where animals move and show how the Samis lived in the past.

They tell us about the Sami livelihood, they are put in strategic places which can give us clues about the space and the Sami lifestyle. They leave an obvious mark in nature but are not for that sake destroying it. Without knowing what they are they might seem like a strange natural feature.

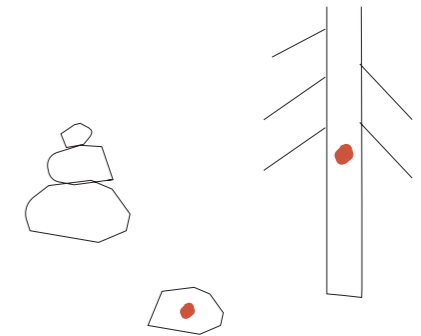
Other human traces in fjällen



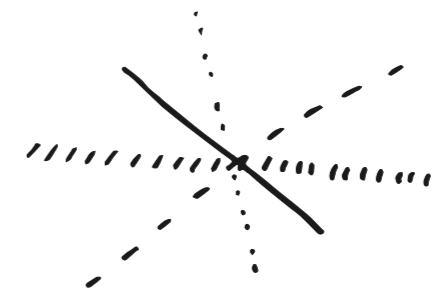
bridges



Rengärde - Separation and slaughter of reindeers



Cairns and Colour marks - Find way in rocky situation with potentially bad visibility or in forest



Reflection

The movement heritage is an abstract term used to explain the subtle but rich culture of fjällen. The term aims to gather everything that is, in a somewhat restricted categorization, connected to the culture and nature in fjällen to be able to understand it.

The features explained as human traces might not be of great importance and value by themselves, but together they paint an image of the complex area. For example there are a lot of different attributes to display trails. The individual elements are used in areas where they are best fit and altogether they help one understand the complex network of trails and thereby movement of fjällen.

The Sami culture has a history of not leaving anything behind, because of this it can be difficult to discover traces of their lifestyle. But small changes in nature can hint about where they have been moving and living. Adding every small element to the bigger picture might get a quite good idea of Sami history.



Dartmor Wind Circle 1985 by Richard Long (Careri 2009)

Moving - a change of scenery

In the Swedish mountains one experiences a lot of different nature and natural phenomena when moving through the landscape. The appreciation of these nature experiences are probably the base for mountain tourism. The Samis show a lot of respect to nature and appreciate it as this has been their home for centuries (Labba, 2020). Experiencing sceneries and nature when moving through the mountain landscape, play arguably a big part in the movement heritage. One moves through the landscape and experiences a lot of impactful natural effects through that movement, whether it is one's goal or not.

Solnit states in her book *Wanderlust* (2000):

“Walking can be imagined as a visual activity, every walk a tour leisurely enough both to see and to think over the sights, to assimilate the new into the known.”

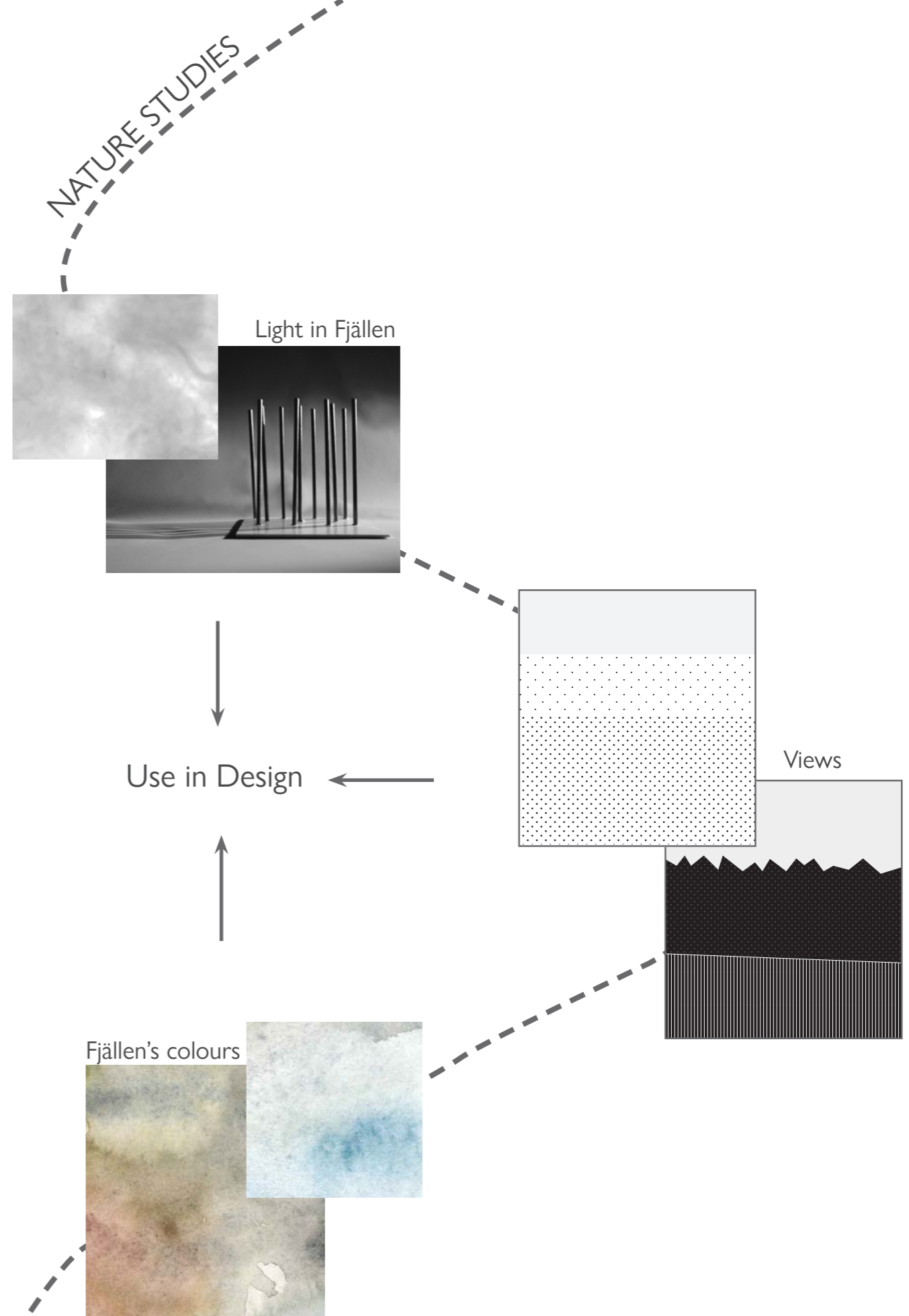
One can assume that Solnit means that by just walking, you observe and learn by the activity itself. But what do you do with that knowledge?

In his work *Dartmor Wind Circle*, Richard Long (2002)

shows, in a circular movement, how the wind blows from different directions depending on where you stand within the circular movement. Long (2002) shows that wind does not come from one certain point but is affected by different natural shapes. This means that when walking, the experiences will constantly change, and not just visually. Arguably the activity of walking enriches one's understanding of a landscape.

One can argue that breaking an experience down like this makes you reflect more on the landscape and your presence and position in it. In this chapter different sceneries and natural phenomena, i.e. learnings, that have been captured on fjällen-journeys are explored through design. This way one might be able to understand the complex landscape and nature better - and reflect on it. This knowledge can then be used when designing architecture in fjällen to enhance experiences that are a part and even sometimes reasons for the movement heritage.

Therefore, following studies have been done: *Light in Fjällen*, *Views* and *Fjällen's Colours*.



Light In Fjällen

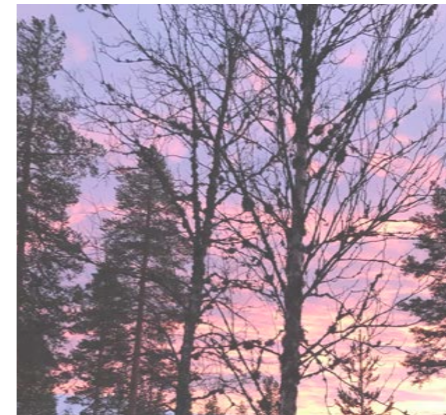
The light has a big impact on the experience of being in fjällen. There are several light phenomena affecting the impression of the landscape as well as human behaviour.

Because of the northern position on the globe, the sun creates interesting and beautiful effects throughout the seasons of the year. Aurora is perhaps the most known one, but when being in fjällen, midnight sun, sunset and sunrises can be just as memorable.

The snow and ice, both on ground and in the air, can create interesting light phenomena, like sun pillars and halos, as well as influence the appearance of the landscape.

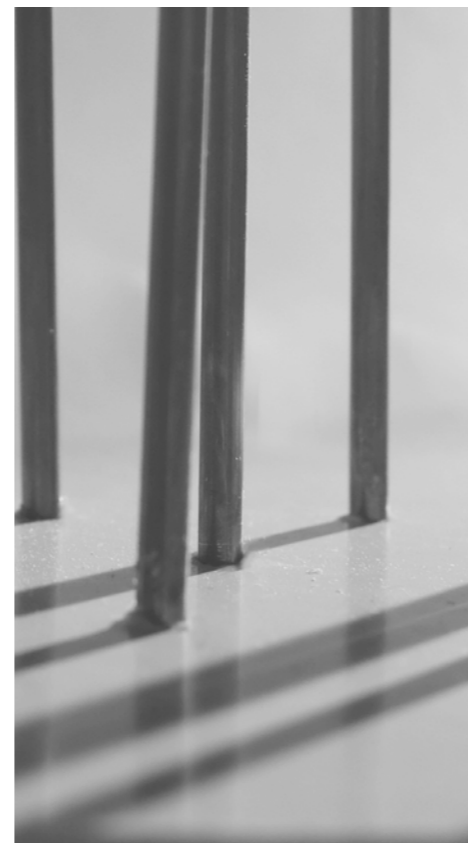
Fjällen has diverse landscape types and varying topography that will generate different experiences and behaviour of the light.

By studying and demonstrating how these light situations occur the understanding of them increases. The knowledge of the light's behaviour can then be used in design to create or enhance experiences. It is also beneficial to know how the light affects a space and to have that in mind when designing.



The light gives colourful experiences out of the ordinary.

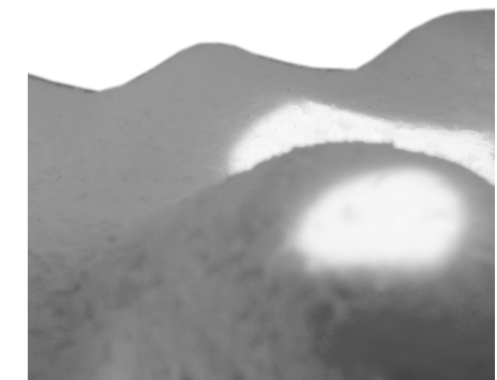
The low-standing sun give long shadows.



Low visibility occurs when being up on the mountain, in the cloud.



Holes in the clouds spotlights the ground.



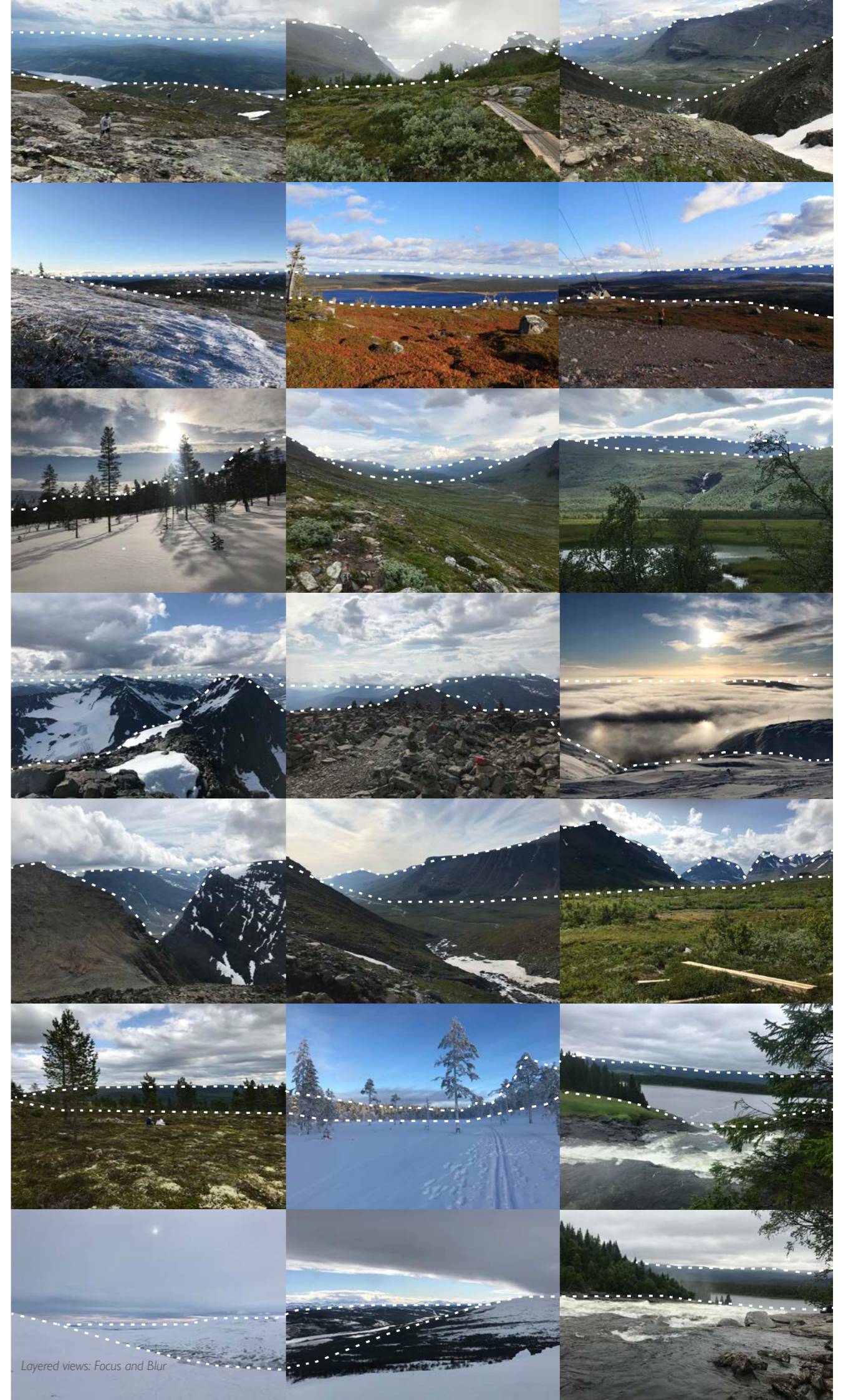
Views

A crucial part of the mountain experience is the views. They are extensive and often breathtaking. When looking at photos from fjällen, these mesmerizing views are often what you capture. This is found in own documentation and in others. It is what you remember and what you aim to find when being in fjällen.

The view-exploration consists of two different studies with the aim to demonstrate and simplify what one watches.

Focus and Blur

The far silhouette hints about how the landscape changes. Perhaps this is what encourages one's desire to move in these areas. One wants to reach that point in the distance.



Layered views: Focus and Blur

Views

Layers of Texture and Shape - Mountain

Nature consists of various patterns and forms, which becomes clear in this simplification study.

When moving through fjällen one experiences all these changes, even if not aware of it. Perhaps this contributes to making moving through the landscape so stimulating and at the same time meditative.

Changes - small and large

The patterns and forms appear in the smallest gravel as well as in the large mountain silhouette.

The larger cliffs and blocks can create interesting spatial conditions and sleek surfaces.

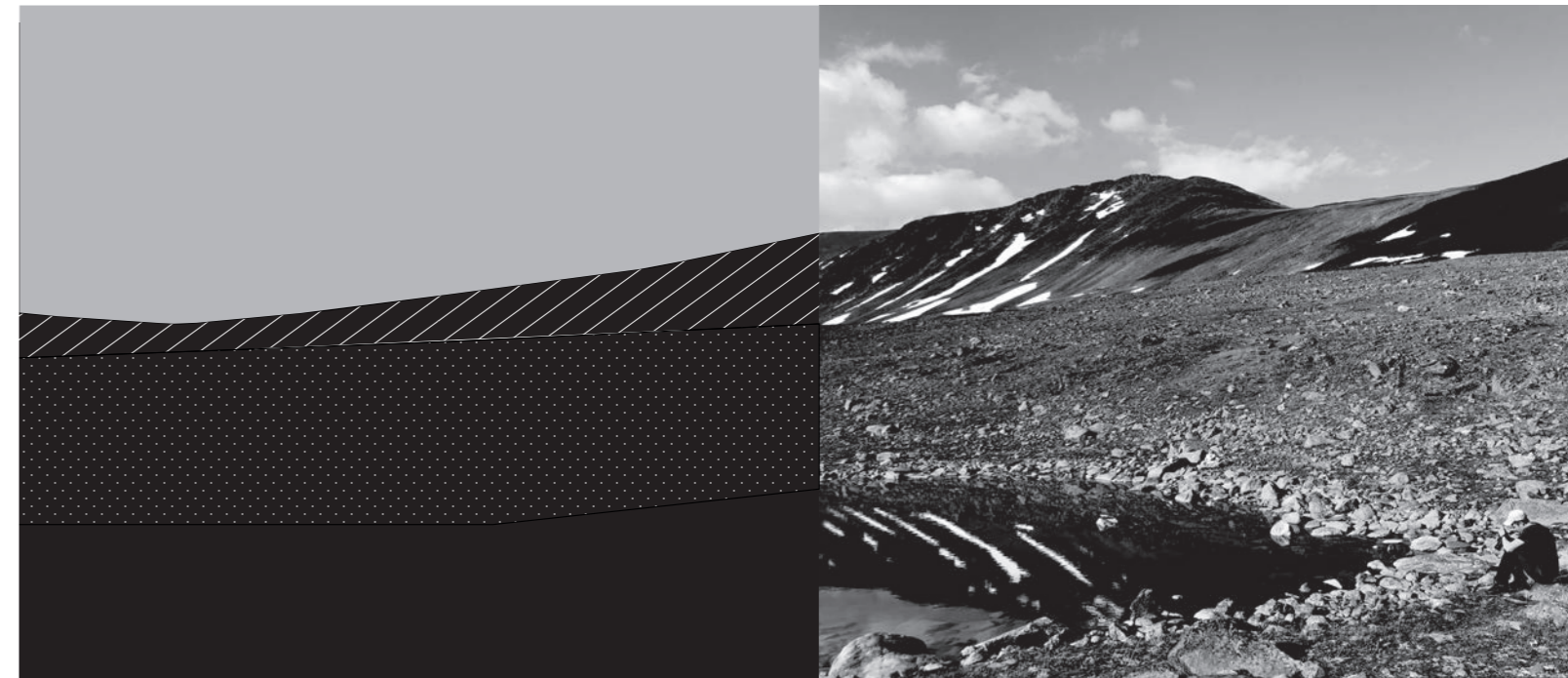
The smaller blocks can create spatial qualities as well, especially when stacked. This happens both when it is naturally created and when the rocks are piled up by humans. The blocks can be hard to move over and a certain amount of climbing is sometimes necessary.

The smaller stones and gravel usually give a more walkable surface even though it might cause slipping and tripping accidents.

Identifying these patterns and forms can be useful when designing in fjällen, and even nature in general.



LAYERED VIEW : The various landscapes builds layered views, where contrasting shapes and textures meet.





LAYERED VIEW: VALLEY. The landscape types are many and with the extensive views, layers of these types generate interesting scenes.

Views

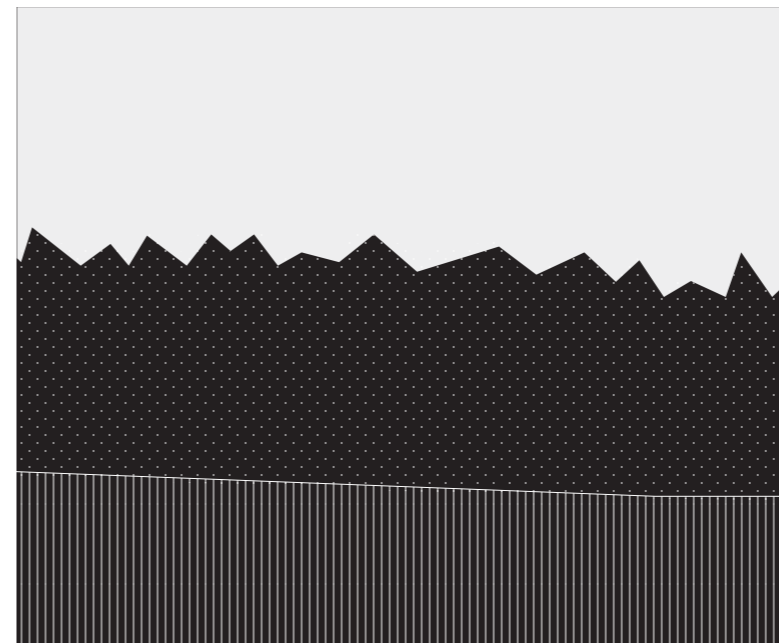
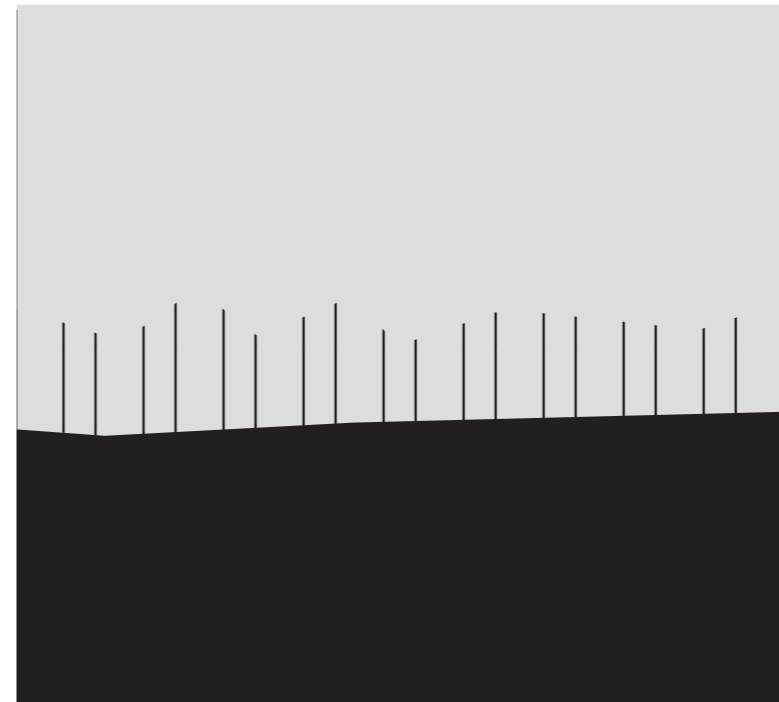
Layers of Texture and Shape - Valley

The forest in the horizon becomes a boundary between land and sky. The shape of it can vary a lot due to season, topography, denseness etc. The dynamics between forest, mires and open ground also contribute to the rewarding movement through the mountain landscape.

Slender Vegetation

Because of the northern position and the topography, the supply of light in fjällen is low. This causes the vegetation to be very tall and skinny.

Having visited other parts of the world, this seems very characteristic for Scandinavia.



Fjällen's Colours

The colours part in one's preservation of the Swedish mountains are arguably important. They are quiet discreet and humble, perhaps contributing to the melancholic feeling.

Low Saturated Colours

Due to the angle of the sun the colours of the north does not appear as bright as they would if the light had been stronger. This gives the characteristic natural "Scandinavian Colours".

The Fjällen Palatte

To find the colours of fjällen plenty of photos have been gathered and mapped according to colour in a collage.

Even though the photos in the collage are from different sites, seasons and weather conditions they seem to belong to the same palette. The painting explains this even further through simplifying.

When moving through the landscape of fjällen, one might come across different colours but because of their similarity in nuance the experience of the landscape seems united. One could even say that the fjällen palette contributes to giving this cohesive mental image of the whole of fjällen.



Mapping colours: Collage.

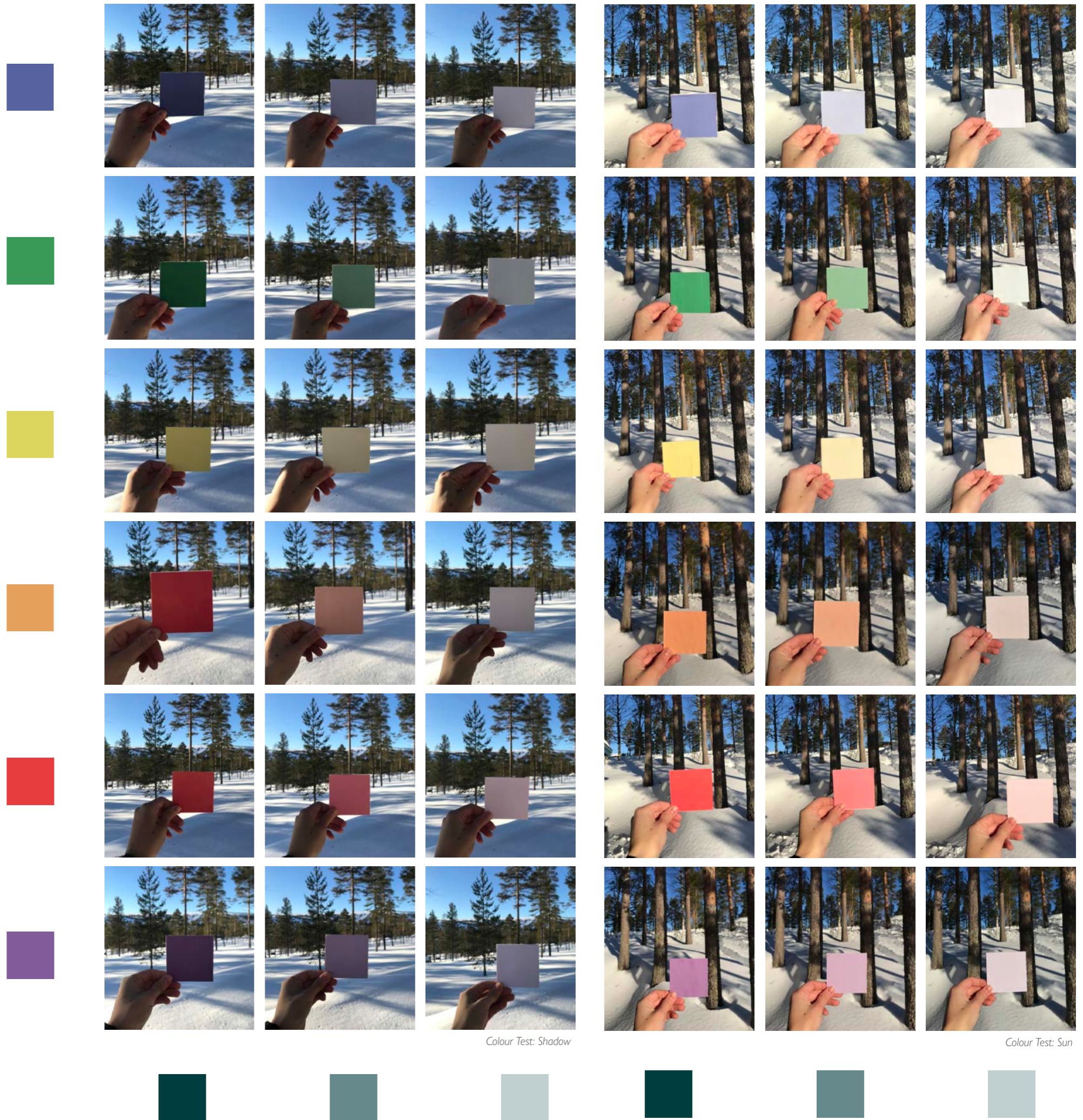


A simplification of the collage.

How Colour Behave in Fjällen

As fjällen has its own palette, the behaviour of different colours and nuances of them are studied.

The study shows what colours are visible and not. Whether they look nice or not is up to oneself to decide. When designing something in fjällen, this can be a useful tool when choosing colours, depending on what you want to achieve.



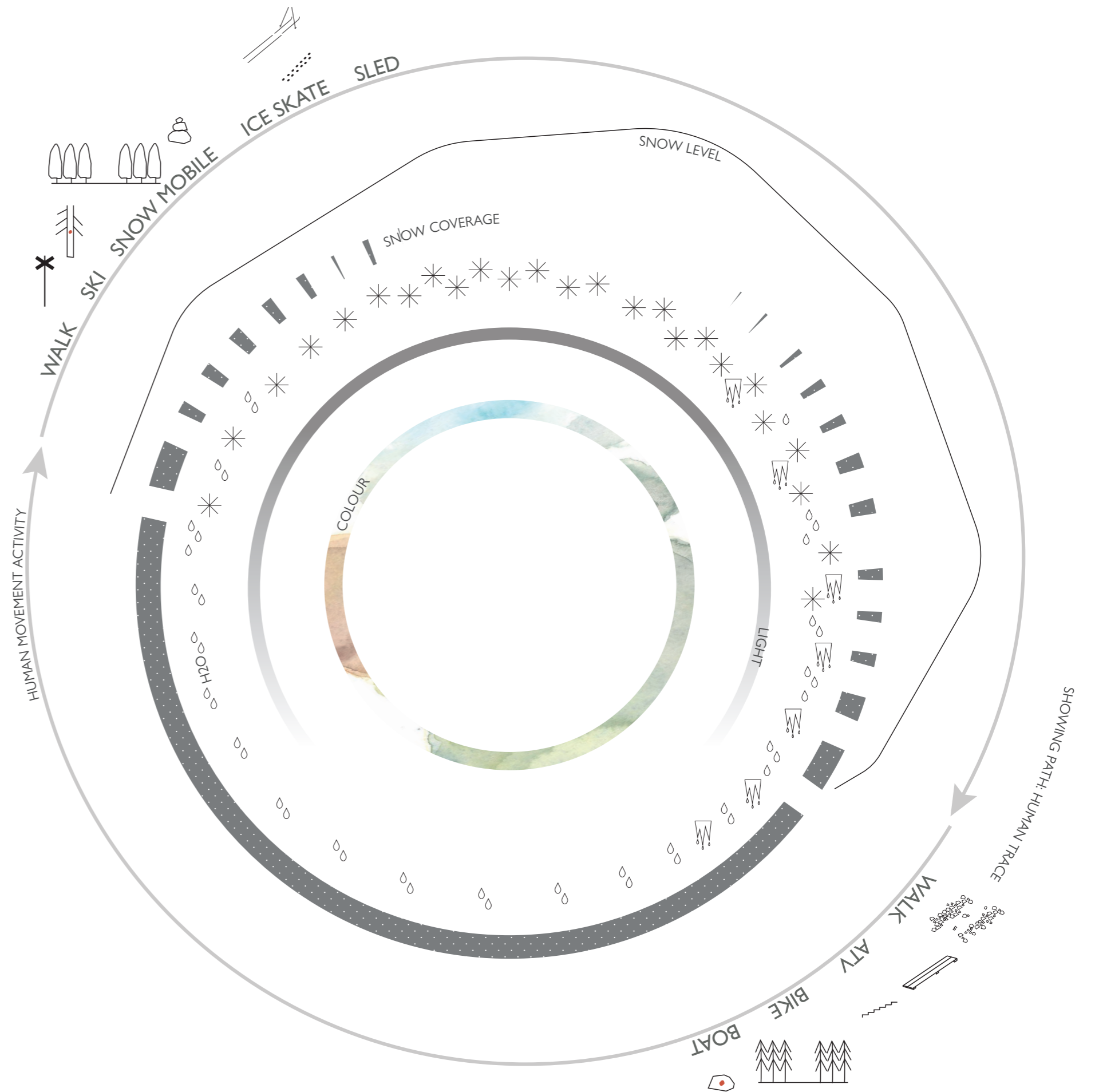
The Seasons

This diagram sums up the nature studies and the movement activity through seasonal changes. It shows how the landscape changes in a year and how humans adapt to it.

The perception of the landscape changes a lot through the seasons. The colours and the light shift. The snow that covers half of the year makes the views change constantly. These themes are affected by each other and contribute to the fjällen experience.

Humans move, whenever it is possible, and adapt their movement activity to the snow, light, viability and colour which in turn demands different movement features. The features are put in the landscape and become human traces.

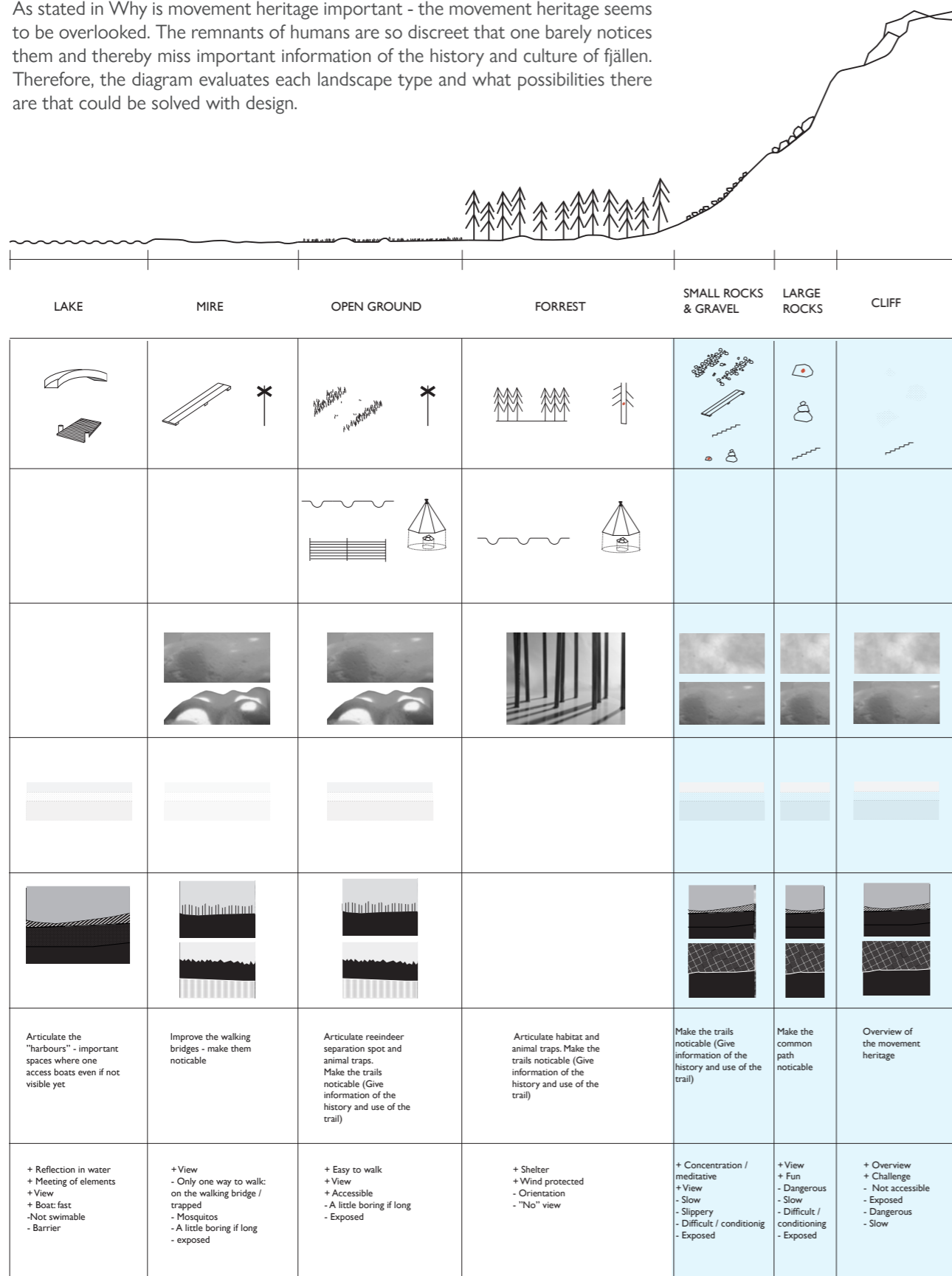
The movement heritage consists of all these layers of nature, human activity and cultural artifacts and it is shaped by the seasons.



Variations of Landscape

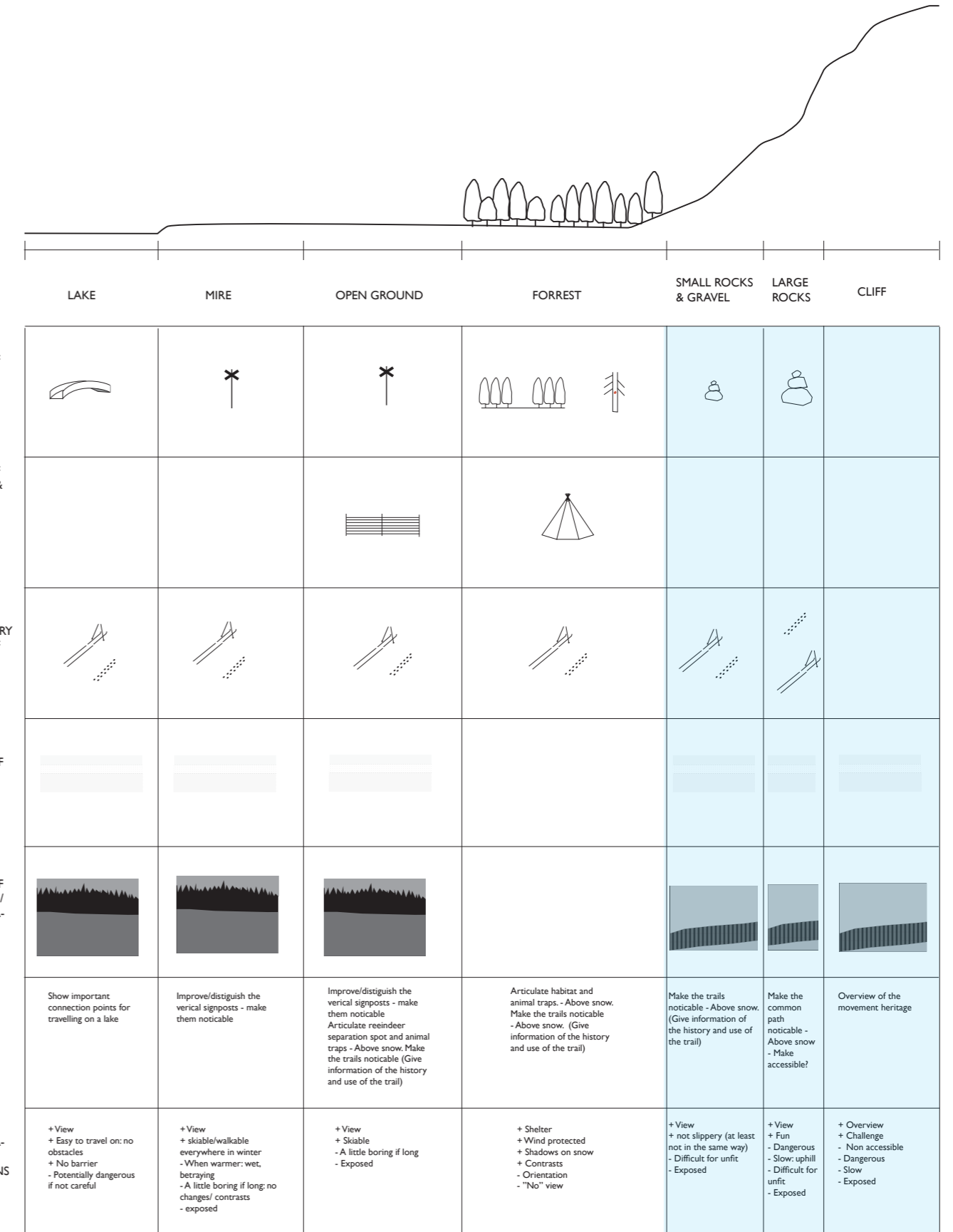
This diagram categorizes the nature studies and human trace by different landscape types. It shows the connection between nature and human activity, this is stressed as that is what the movement heritage represents.

As stated in Why is movement heritage important - the movement heritage seems to be overlooked. The remnants of humans are so discreet that one barely notices them and thereby miss important information of the history and culture of fjällen. Therefore, the diagram evaluates each landscape type and what possibilities there are that could be solved with design.

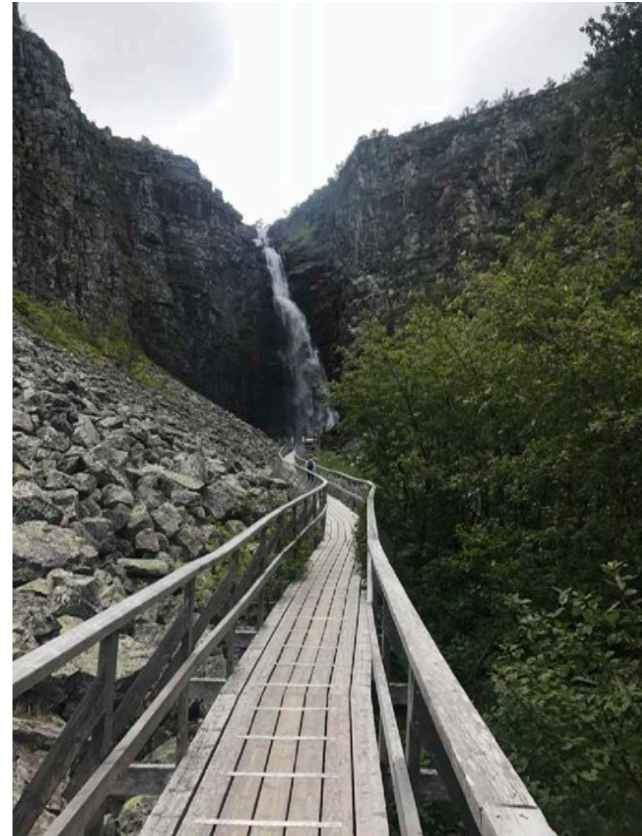


Variations of Landscape

Snow Season



PT 2. Design



Footbridge Fulufjället

Natural systems and human presence in nature

Architectural additions and research within its field have the ability to help understanding and imagining ecosystems and the different types of balances found in natural conditions. The configuration of landscapes is often a consequence of the elements and the balance between them. The elements are often a mix of natural and human ones. (Gómez Sal, n. d.)

The outline of the environmental services such as education and leisure is not always enough to guarantee the viability of a valuable landscape (Gómez Sal, n. d.). This could arguably be the case in the Swedish mountains.

Mapping of a landscape and its history can promote a discussion of the natural systems within it and can help to analyse future relevant strategies of conservation. (Gómez Sal, n. d.) This is one of the aims within this thesis.

How can architecture help to promote and preserve the movement heritage in fjällen?

As Gómez Sal (n. d.) mentions, nature in itself is not always enough for humans to value an area. One can therefore assume that there is a beneficial use of design additions, additions whose purpose is to give appreciation and understanding of the area.

As mentioned in the movement heritage chapter, humans have left a few features in the fjällen areas. These simple structures are mostly a result of people trying to make travelling and residing easier. The structures are mostly basic and strictly functional, arguably not designed in a way to benefit the spatial experience and atmosphere. One can therefore argue that there is a possibility to redesign these simple features so that one values the cultural fjällen landscape more - by creating spaces that enhance the natural features, articulate certain spots and hint about fjällen culture.

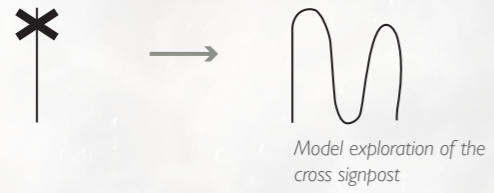
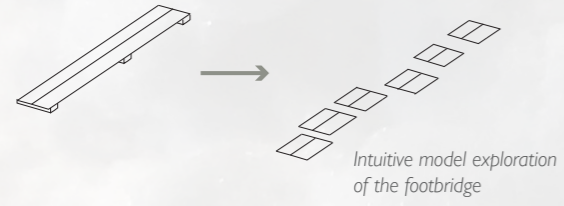
In this chapter the possibilities of structures in fjällen are explored through design with the aim to find a way to promote the movement heritage.



Riverbed (2014), art installation Louisiana - Olafur Eliasson

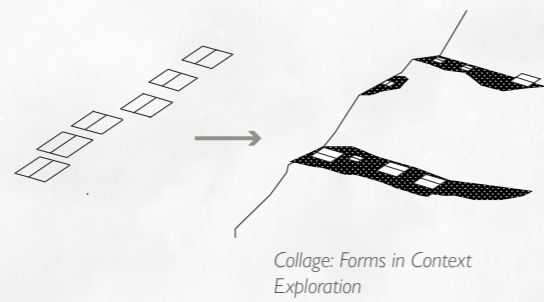
Museum of Modern Art, Photo: Anders Sune Berg

1 Formfinding

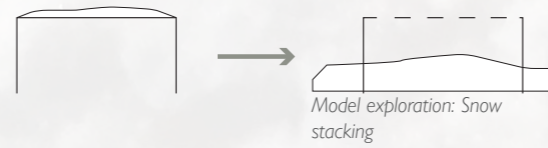
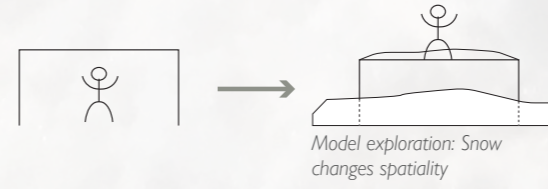
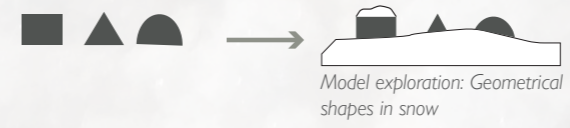


DESIGN PROCESS

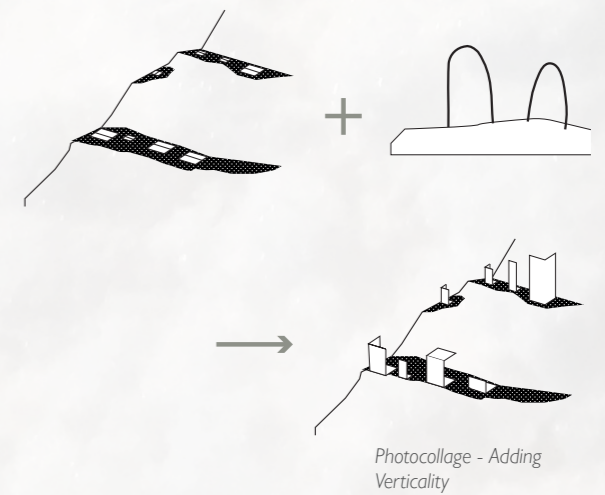
2 Contextualizing Forms



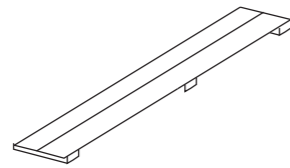
3 Verticality - Shape, space & Snow



4 Adding Verticality to Context Collages



Intuitive Model Exploration Of The Footbridge



The Footbridge

- Lets the vegetation rest from human walking.
- Easier to walk on.
- Can be used on all sorts of flat ground.
- More visible than a natural trail

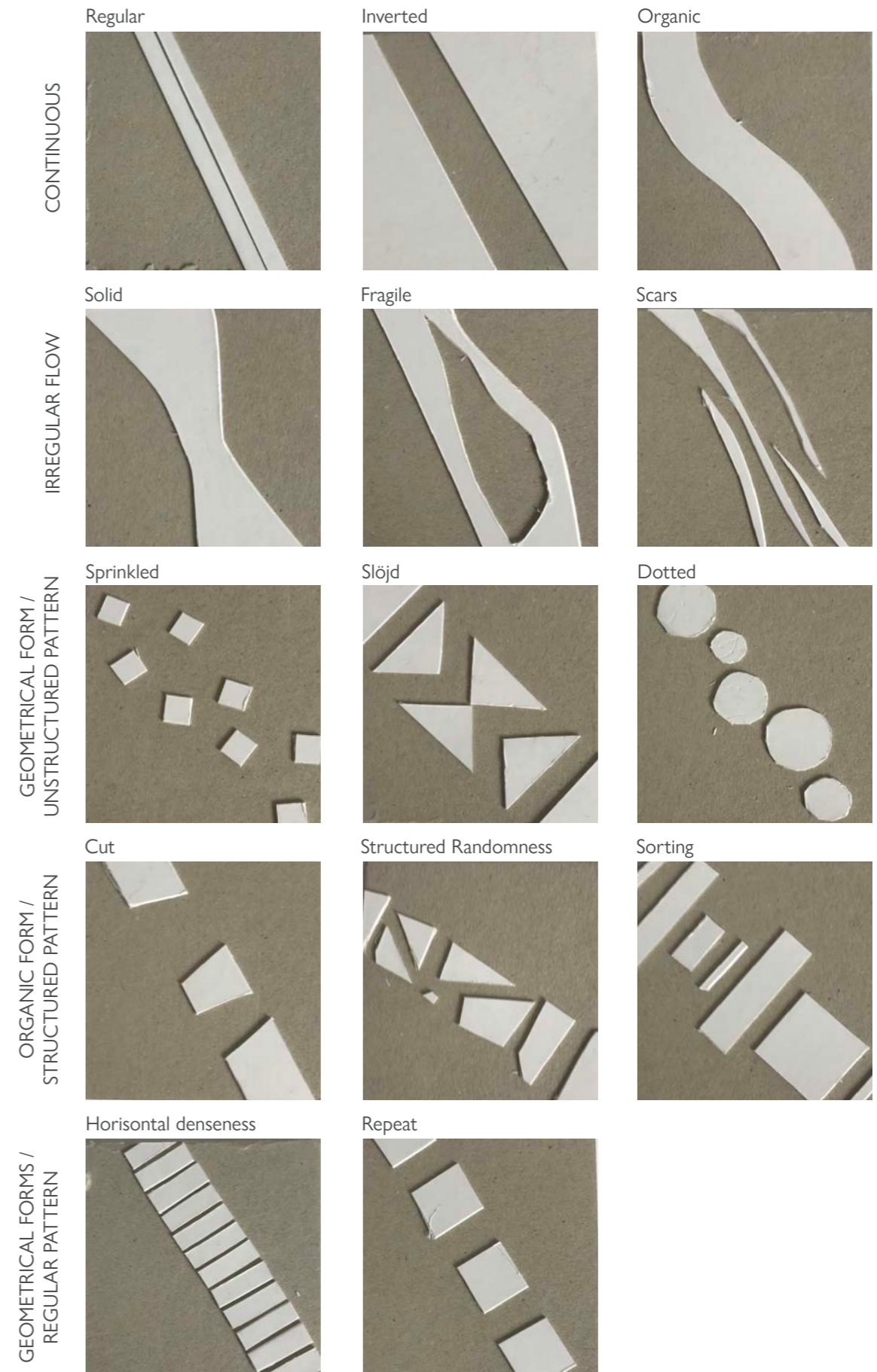
As a design element

In the Swedish mountains the footbridges generally have the same execution: very basic, wooden planks. There is an opportunity to redesign the foot bridge element in a way that it will distinguish itself from others - to articulate a particular path.

In this study the footbridge is manipulated in different ways; reshaped, inverted, removed etc. The models are named and categorised into groups with similar ones.

The hope was to find a shape that would give an enhanced experience of those nature phenomenons explored earlier in the process.

But when analysing the models individually the conclusion was that they would have to be contextualised to get a proper evaluation. This resulted in the collage exploration shown later on.



Model Exploration of The Cross Signpost



The Cross Signpost

- Leads the way in spaces where trails aren't visible; Snow, mire
- Contrasting colour in bad visabilty conditions
- Contrasting shape compared to natural features
- General design all over

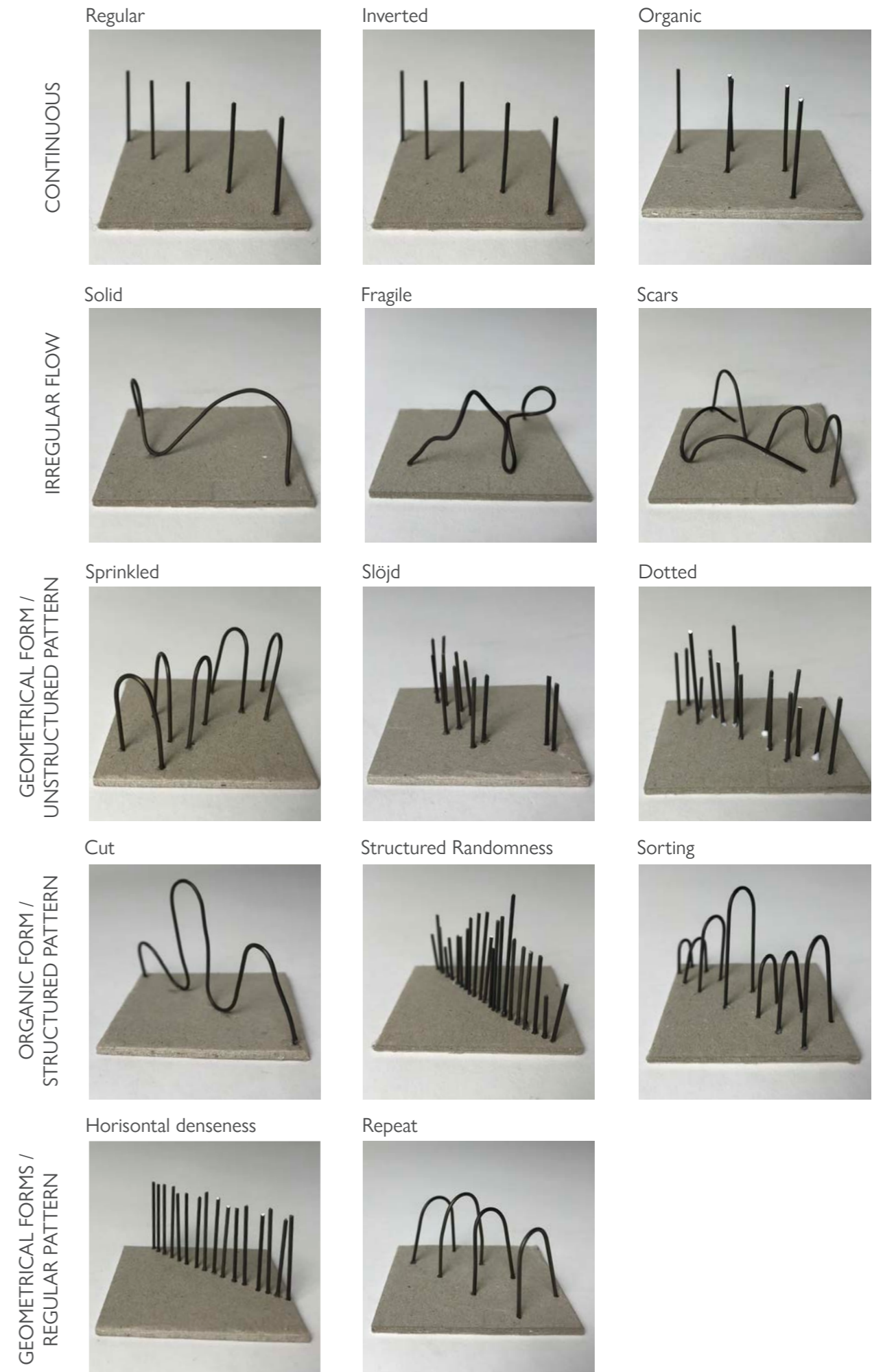
As a design element

In the Swedish mountains the cross signposts generally have the same execution due to standardisation. If adding another sort of vertical element it will probably be acknowledged from passers-by and could thereby hint of the movement heritage.

Based on the models in the footbridge study vertical interpretations were made. Just like in that exploration the hope was toto find an improved design that also would enhance the experience of nature and culture.

Obviously, the conclusion was the same as before: the models need to be contextualised in order to be able to move on.

Even though they are an interpretation of the other models they seem a bit unconnected, which also is the case for the footbridge and the cross signpost. It is partly because of the different choices of material. Either way, the surface and the vertical elements could be more integrated with each other and not be two separate features in order to get a better design.



Context Collage Exploration: Cliff

Effect by Human Element

In the layered view study different shapes and patterns were found. By this study the aim was to, by adding human elements, achieve different effects acting together with these shapes and patterns. Based on that the hope was to find visually pleasing and suiting design features in fjällen.

The surface models were placed in a photo of a cliff situation. The character of the model and how it could behave in such a space were explored.

Balance between Nature and Architecture

The verticality of the natural space causes interesting situations to work on. It creates platforms and walls that have natural spatial qualities. In almost every collage these natural platforms are used, they work as seating, flat ground, path, stairs etc.

When the form is adapted to the natural shapes of nature it works really well. That does not mean more strict forms can not be used. The balance between strict forms and organic forms can create an interesting dynamic.

Working the natural spatial qualities of the landscape and then adapting to them, is a design strategy that comes from this study.

Using the landscape's own features and material connect back to the way one have been designing in fjällen in the past, and could thereby be a wink at the sami culture of taking what one has.





Geometrical Shapes In Snow

Snow Coverage

Snow is covering Fjällen at least six months of the year. It can not be neglected when considering designing here as it will change the appearance of the design when covered.

To demonstrate this, basic geometric forms are used and covered in snow. The different stages of the snow coverage were documented in order to see how they behaved.



Where does it stick?

Snow affects the appearance of shape depending on how it covers it. The cubic forms gather snow on top of them while its vertical sides stay clean. The snow does not stay on the pyramidic form, probably why it is used in cots and similarly in triangular-shaped tents. The snow partly falls off the arciform shape, which is also a common shape of tents.

The findings were not surprising, but still important to take into consideration in further designs as the winter season in fjällen have a great presence snow. It will affect the form and use in different ways since the snow level constantly change. The wind also affects how the snow behave together with the shapes. Unfortunately the snow was to crusty to explore that.

Obviously angles and size would change the outcome a bit.

Snow Changes Spatiality

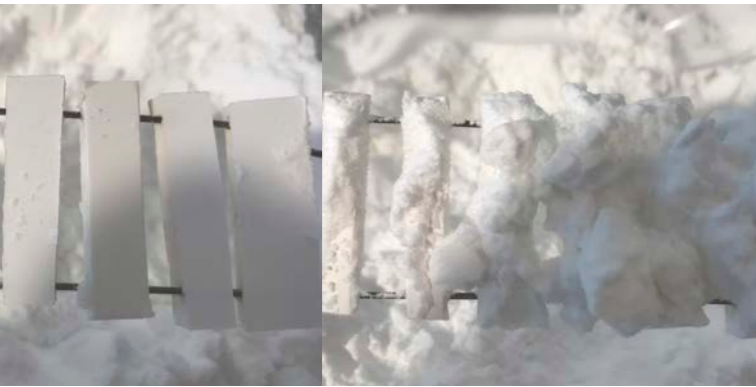
Snow and Archiform

The snow does not only affect the shape but also space. This was another quick study, on how the snow level affects the space created by an arch. The idea is to demonstrate how spaces can disappear and transform.

Making Spaces

The roof becomes the floor when the ground is covered in snow. The space underneath the arch would naturally also be covered because of the wind, why walls would be interesting to explore.





Snow Stacking

Snow that falls between

This is a study on how much surface would need to be open in order for the snow to fall between. A structure of rectangular pieces was gradually separated.

If the relationship between the pieces and the holes was about 50% the snow would fall between in this case. The result might not be definite as potato flour was used to simulate the snow, actual snow behaves differently depending on its consistency. However it can be a clue on how to design horizontal surfaces depending on what one would like to achieve.

Repeat



Scars



Dotted



Structured Randomness



Fragile



Cut



Snow + Vertical Elements

Appearance in Snow

To connect back to the previous investigations the appearance and behaviour of some of the vertical element models in snow were studied.

What do you see?

The thinness of the structures causes the snow to not stick to them. This is probably why the cross signpost is designed slim in metal-material.

The appearance of the elements obviously change as one is not able to see what is underneath the snow, some of them even become more similar when only the top part is visible.



Photocollage - Adding Verticality

Walls and Roof

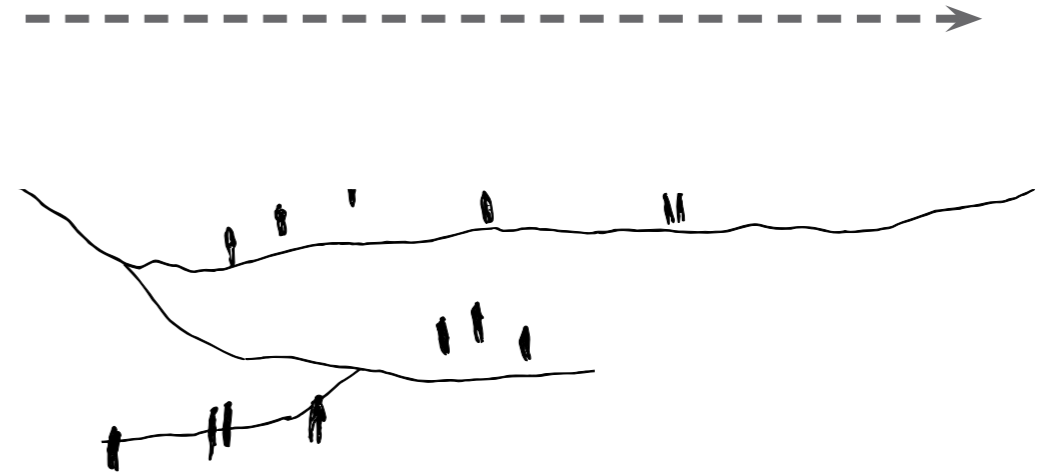
Having done the snow studies the necessity for verticality in the different landscape types was obvious. The photocollages were therefore revisited and existing structures were manipulated vertically, by raising them and creating walls and roofs.

The Opportunities

Like stated previously there was a wish for the vertical element to be more integrated in the surface. Which is why continuous surfaces are used and raised as walls and fences. This resulted in balcony-like platforms. Adding a fence or creating flat flooring could create comfortable spaces to rest, view, walk and even stay overnight. If adding roofs, shelter is provided as well.

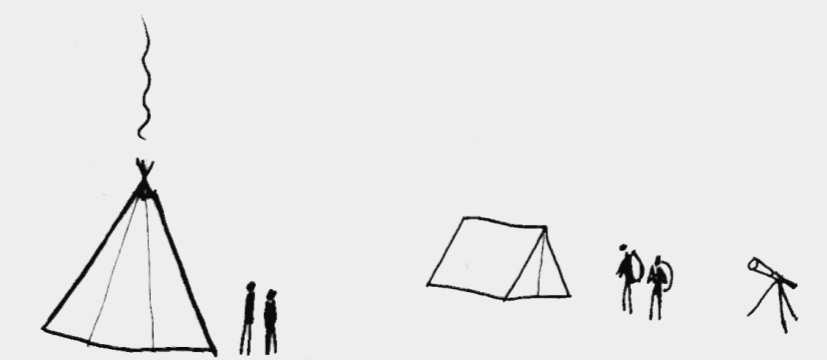
Design Proposal

In the design proposal, aspects of the culture of mobility, human trace and nature are combined with the design studies with the aim to represent the movement heritage in the form of an augmented trail.





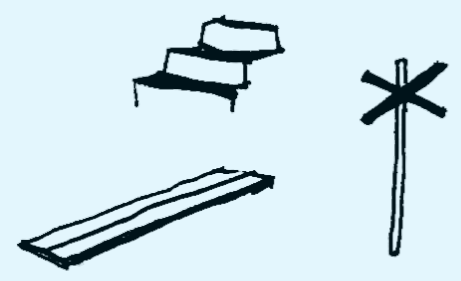
Infrastructure
The trail is the common infrastructure of fjällen.



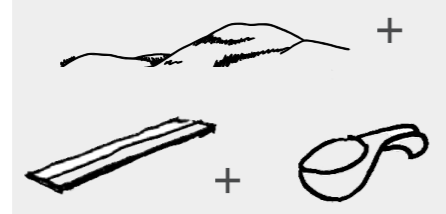
Cultural Aspects
The culture of fjällen lies arguably in the movement. The off-grid landscapes are occasionally inhabited by samis, tourists and researchers. The residents are then transient. These groups use the landscape for different reasons, with different goals but with the equal activity of moving / travel through the space. The architecture is mainly vernacular and temporary, with the "take what you have"-mentality.

THE DESIGN PROPOSAL

AN AUGMENTED TRAIL



Improvement by Human
Humans have in many ways tried to improve it by making it more visible, safe and efficient in places where it is needed and/or where there is a lot of traffic.



Design Proposal
An infrastructural element that provides safety, visibility of the path and efficiency in a functional and aesthetically pleasing way. At the same time it should enhance cultural aspects and natural effects through architectural elements and spatial quality.



Natural effects
When moving through the mountain landscape one experiences powerful natural effects; colour, views and light, which influences one's presence in the area.

Design Strategy

The design should not bend for nature but adapt to it.



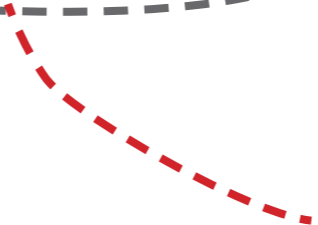
The Chosen Segment

Fjällen is a diverse landscape. In this project the focus will be on cliff. This area come with its own spatial qualities, connection to culture and human use



The Trail

The augmented trail does not have to be one continuous path. Segments of a trail will be used for development.



The Design: WHY

To humanize the space in a way that it shows, but subty
To show that this is a used territory, not wilderness.



Scale

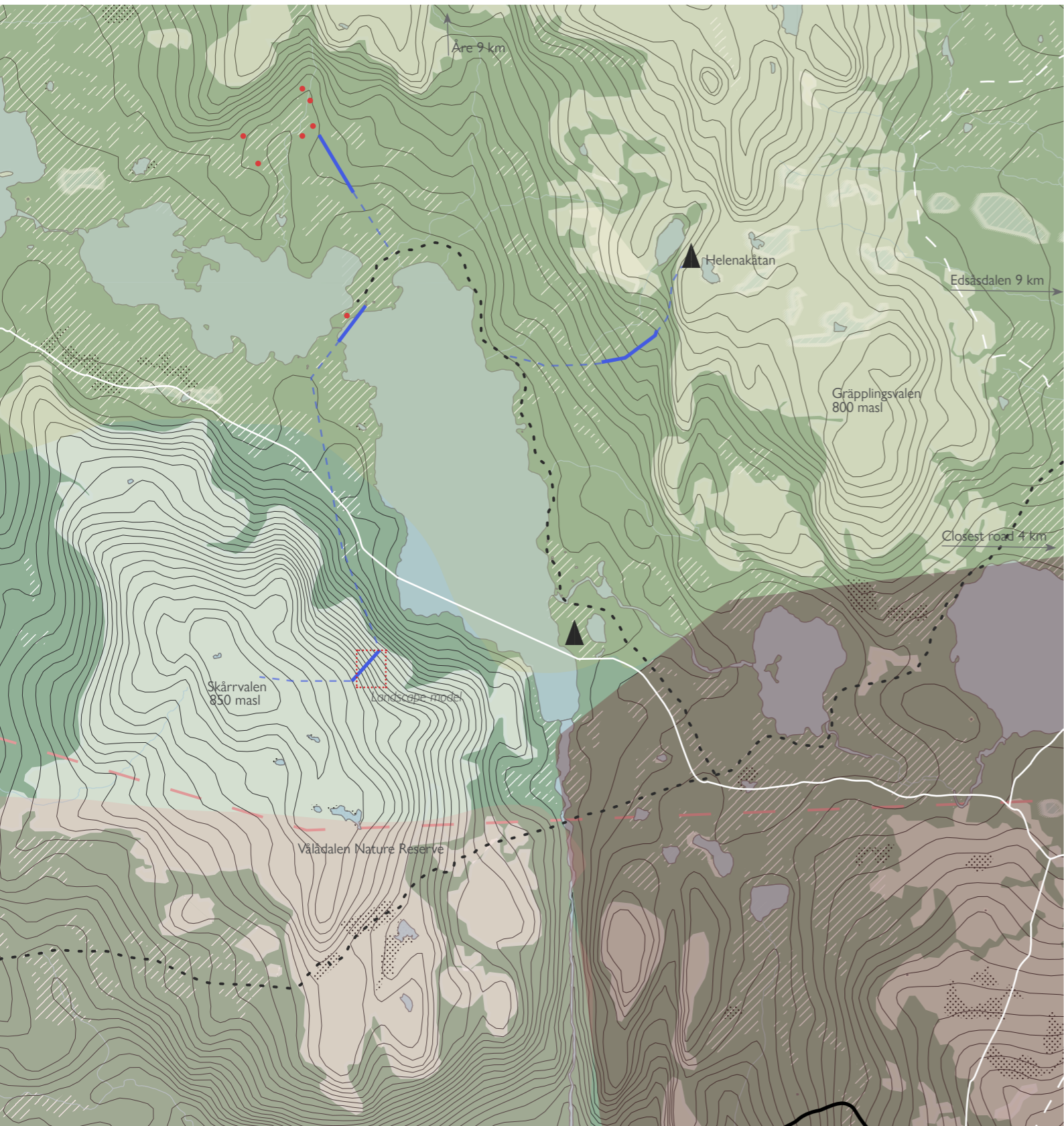
three scales will be used to illustrate the design



- A zoomed out map to show the network



- Zoomed in segments
- Details of the segments



0 1 2 4 km Map Skårvalen-Gräppningsvallen 1:50 000

- AUGMENTATION
- - - NEW TRAIL?
- CONTOUR LINE 25 M
- FOREST
- BARE MOUNTAIN
- WETLAND
- MIRE
- SPARSE FOREST
- LAKE
- - - NATURE RESERVE
- WINTER TRAIL - SNOW MOBILE
- WINTER TRAIL
- WALKING TRAIL
- MARKED SUMMER TRAIL
- WIND SHELTER
- OLD ANIMAL TRAPS
- MAINLAND CALVING REINDEER
- AUTUMN LAND REINDEER
- YEAR ROUND LAND REINDEER

PLACE - The Network

The context which is used for the design proposal is situated in Jämtland, close to ski resorts such as Edsådalen and Åre - meaning that there are many tourists in the nearby area.

It is also land of Samis, which is shown by the different reindeer areas, old animal traps and Helenakåtan (lapp cot).

There is a nature reserve closeby, Vålådalen, where there is a naturrum - providing research and educates about the area.

The design proposal aims to create a visual and walkable connection between the peak of Skårvalen, the system of animal traps and Helenakåtan. This way one is able to overview cultural human traces as well as experience it when walking by.

As the different segments are visually connected one is able to walk between even if there is not a trail to show the way there today. (But it might create one in the future!)

Along these segments one passes several landscape types - adding to the nature/culture experience. One also crosses other trails that go to other places, meaning that the new path will be included in an already existing network.

This place is quite unknown, even to people living in the nearby area. It is chosen as it demonstrates that any random place - just like most of fjällen - contains as much astonishing nature and culture.

The people moving in this area today are quite experienced with the mountain landscape. The place for the design is semi difficult to reach as the closest-by road is four kilometers away. Perhaps a design might bring more people that will discover the value of this area and make them reflect on the movement heritage.

Further on, the design on Skårvalen mountain side is developed as it is the most visible one.

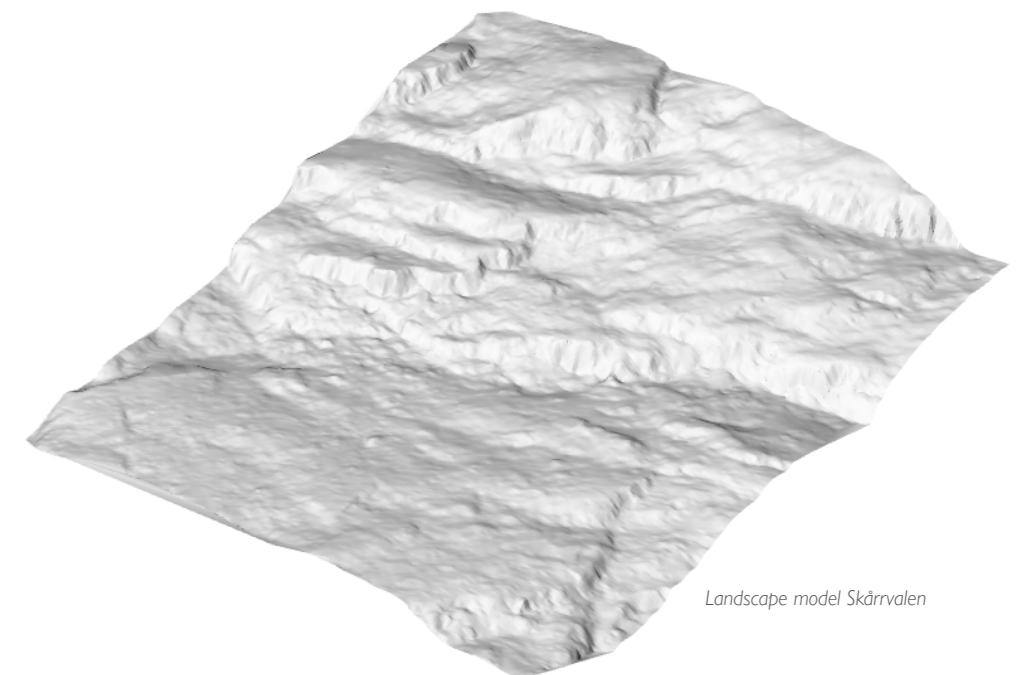
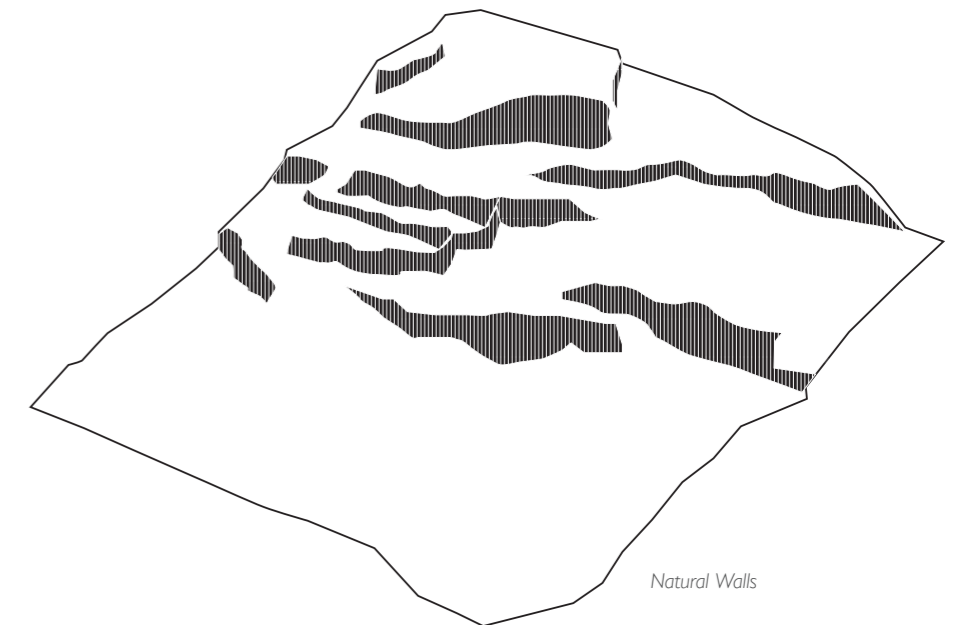
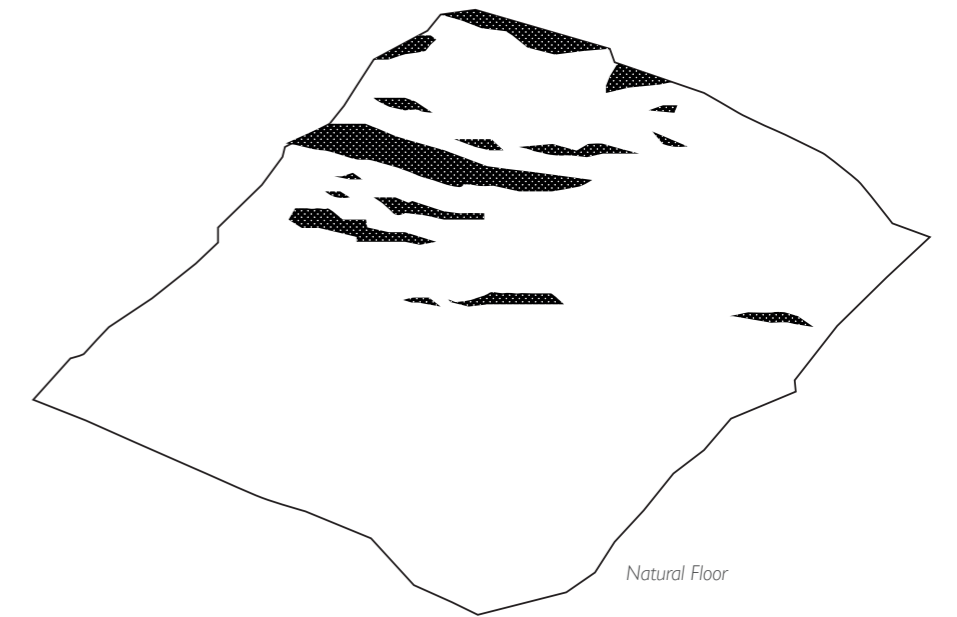
Situation

Skårvalen has a rather craggy mountainside facing east. That means the spatial qualities of the mountain can be used for the design, which was one of the aims found in the collage study.

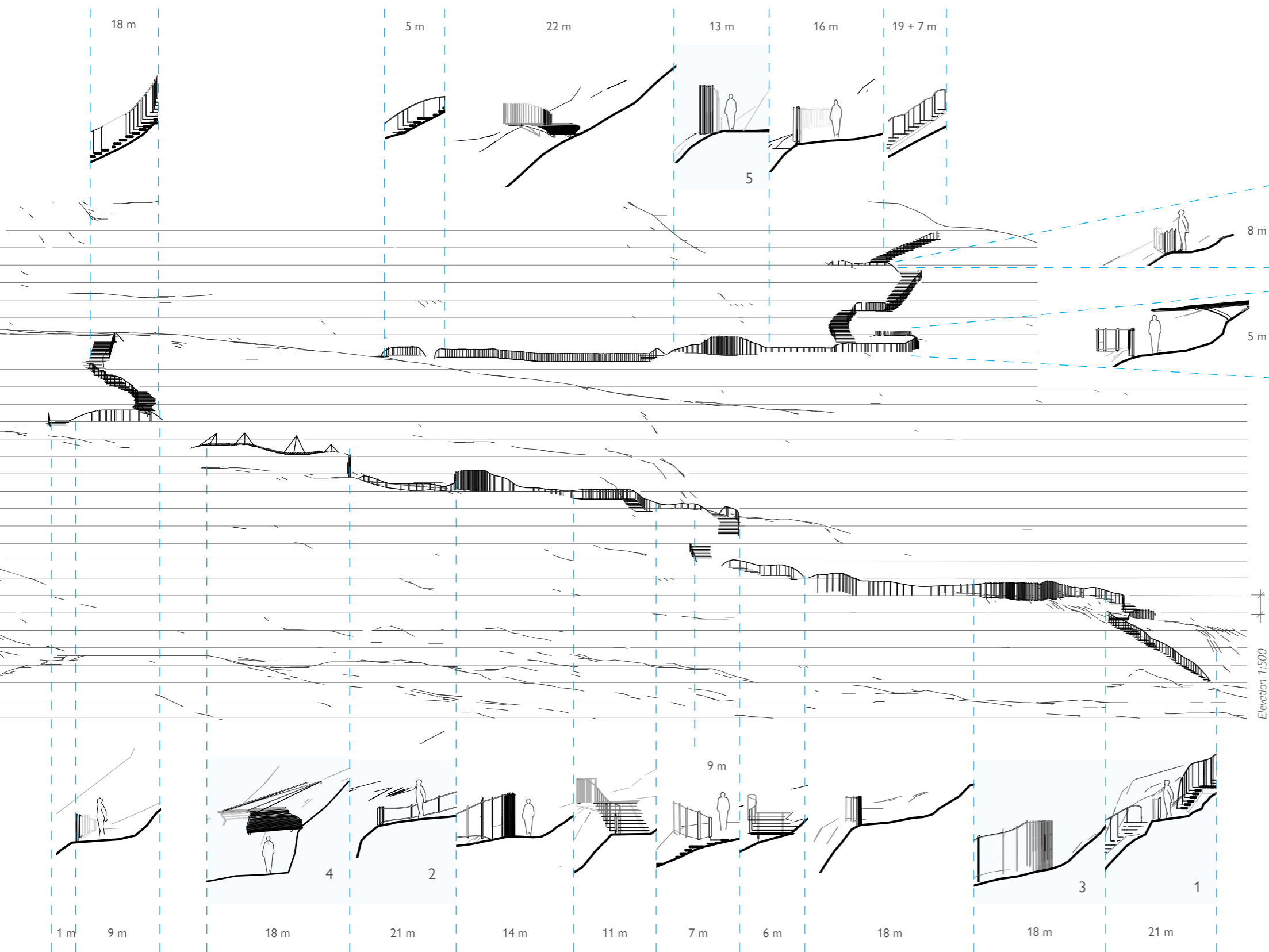
It overlooks the lake and the treeline, making one experience these layers of views described in the views study.



Skårvalen



Landscape model Skårvalen



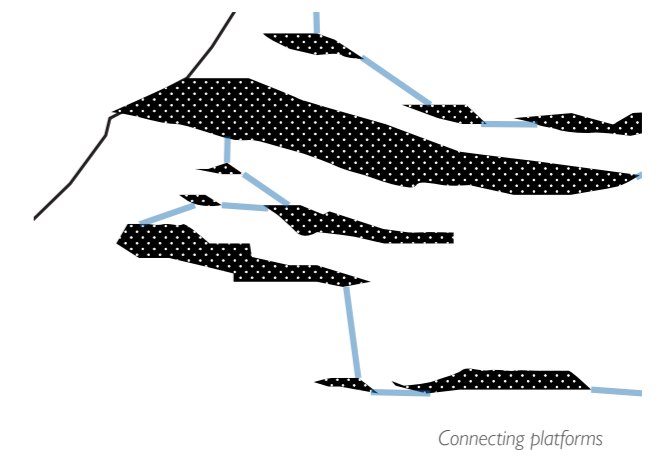
All Sections 1:200

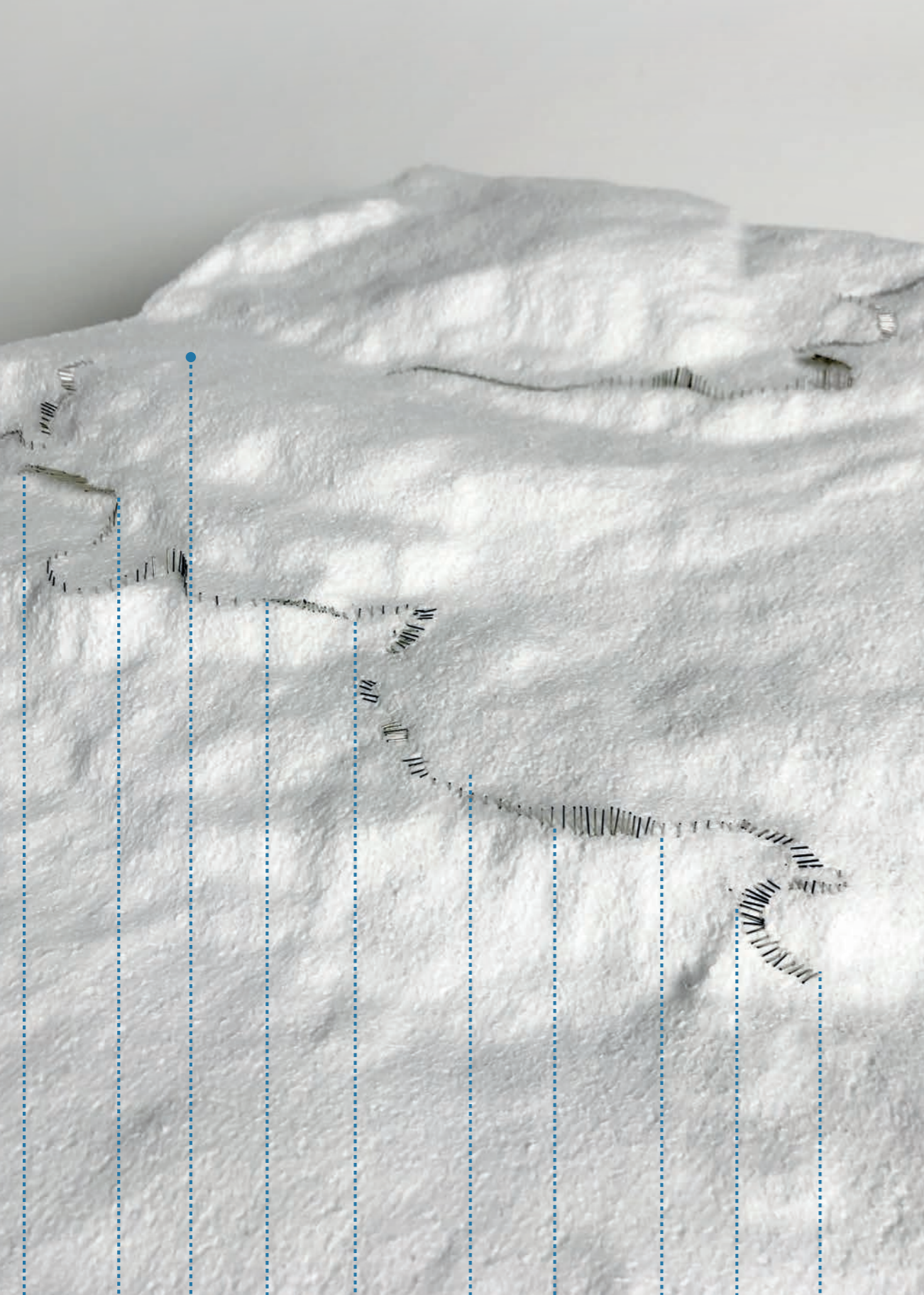
Total Length of the Structure: 266 m
 Total Height of the Structure: 52 m

A Movement Heritage Structure

As the studies of the movement heritage have shown, fjällen is a space where one walks and temporarily resides. Little trace which shows this lifestyle is left. Natural features like trails are obvious remnants of the movement heritage, but also human elements that make walking and residing easier, such as footbridges, stairs and shelters. The nature itself and the experience of it are also a part of movement heritage term, which is explained and explored in the landscape studies

This design is an interpretation of the movement heritage concept. It is a trail which is moving up along the fjäll Skårvalen. It helps one get to the top in a safer way while enjoying the climb up: it articulates colour, light and season. It passes natural platforms and walls of the mountain - spaces where one can rest, take shelter, and set up a camp. The structure adapts to and uses the natural spatial qualities. It enhances them by using the elements of the wall, footpath and ceiling.





Landscape Type = Effects

Nature Studies = Effects

Landscape Pros & Cons

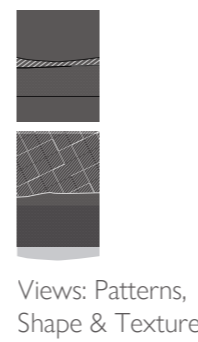
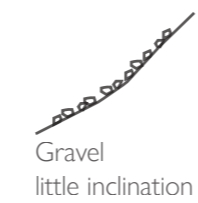
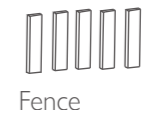
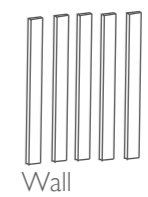
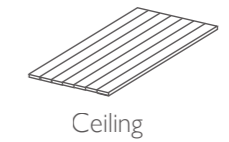
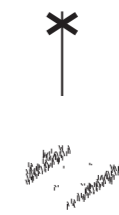
Human Elements

Interpretation

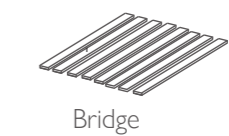
Qualities



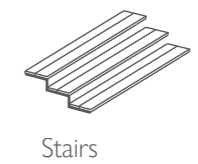
- + Easy to walk
- + View
- + Accessible
- A little boring if long
- Exposed



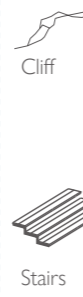
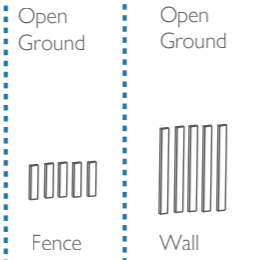
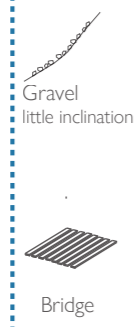
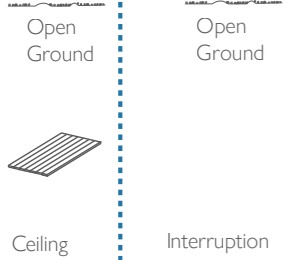
- + Overview
- + Challenge
- Not accessible
- Exposed
- Dangerous
- Slow



Accessible View



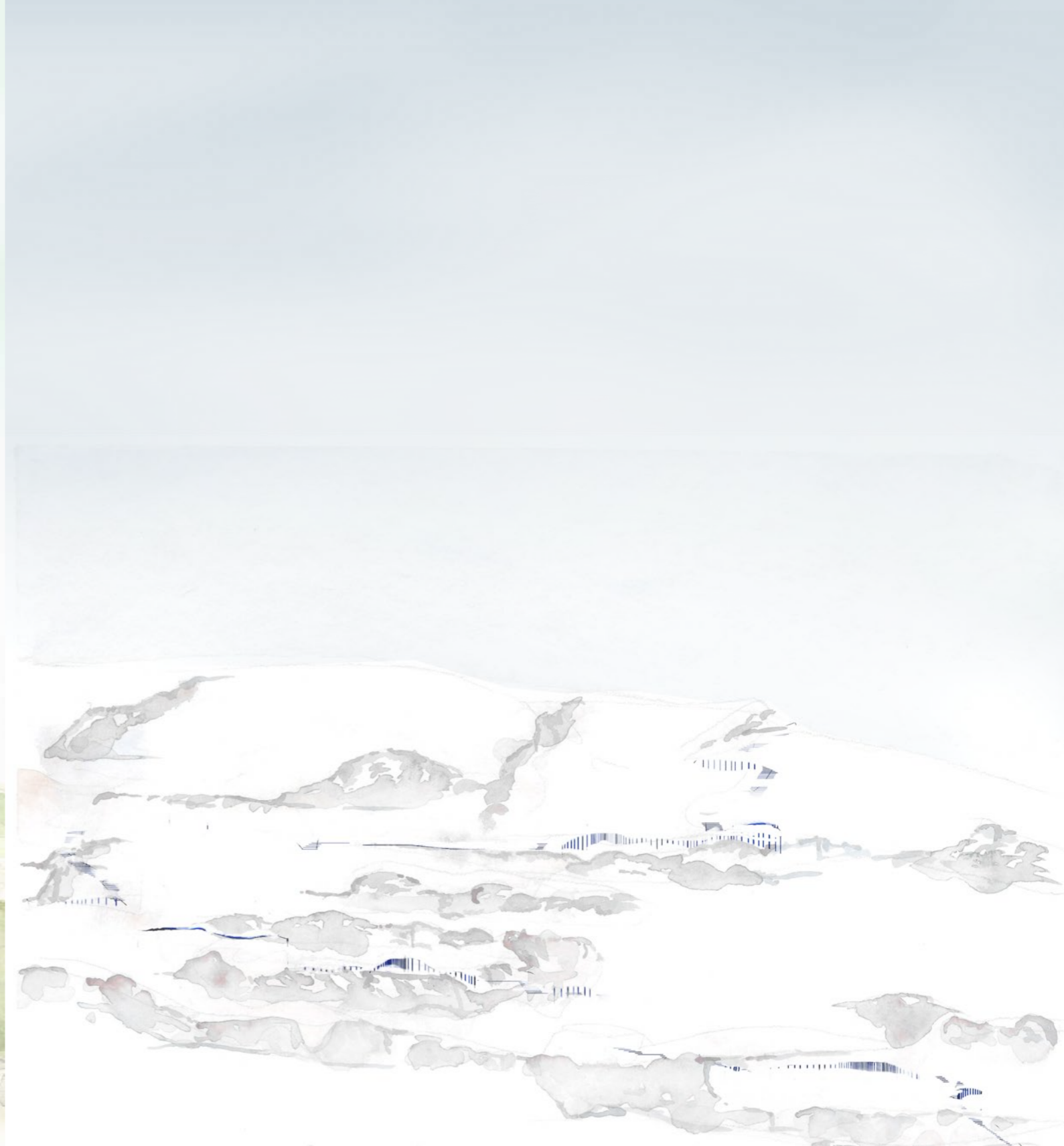
Accessible





From Afar

The structure adapts to the topography and its natural shapes. That way one can argue it will not disturb the view of the mountain. It still hints about human trace with its somewhat organized design - rigid forms in a stricter pattern. The aim is to represent the movement heritage by a trail that dynamically blends nature and design, as studied in the collage exploration.



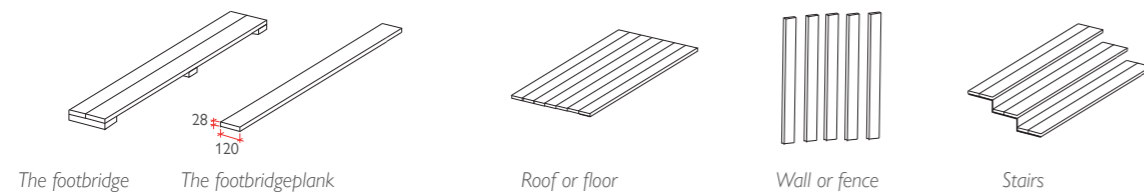
In Snow

The view of the augmented trail changes actively in winter due to snow coverage. The structure varies in height, like the snow + vertical elements studies, to give a changeable experience of the structure - just like in the changeable nature.

Spångbrädan

The plank used in the structure is commonly used all over fjällen for the footbridge, which is explained in the human trace study. This design also uses the plank for the footbridge, but for other elements as well - stairs, guidance elements, fences and shelters.

The concept of using the footbridge plank is inspired by the Sami culture "take what you have"-mentality. One can can, by using one simple plank, achieve several interesting designs by configuration and balance between them and the natural elements.



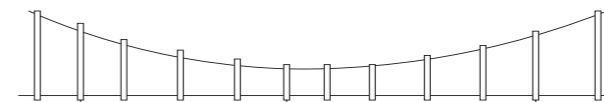
2 Autumn, morning, sunny



Views

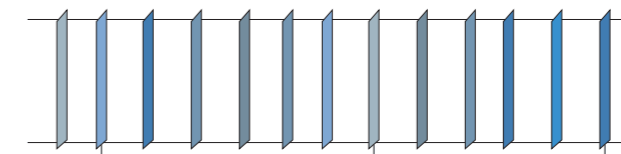
The mountainside where the structure is situated faces east. The structure surrounds particular spaces where one can enjoy the dramatic mountain sunrise views that were explored in the light studies.

The structure becomes a fence in this space, making it safer and enclosed. The views are an important experience of being in fjällen as discussed in the views study. Spaces where one can enjoy views are therefore articulated by placemaking and changes in height and distance of the planks.



The planks changes in height

3 Winter, Afternoon, Storm



The planks shift in nuances of blue

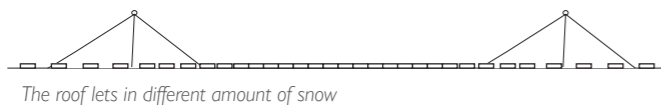
Colour

When the bad visibility occurs, the structure helps one find the way as some of the planks are painted in a more saturated blue.

Blue colour blends in well into the fjällen palette, as can be seen in the colour studies, why the structure uses it but in different shades. The design is then gradually blending into the mountain.

Shape and Snow

The planks are tall and slender so that the snow will not cover them as described in the geometrical shapes in snow study. That study also motivates the triangular angle at the top of the planks - the snow will not stick and cause too much water damage.



Snow and Space

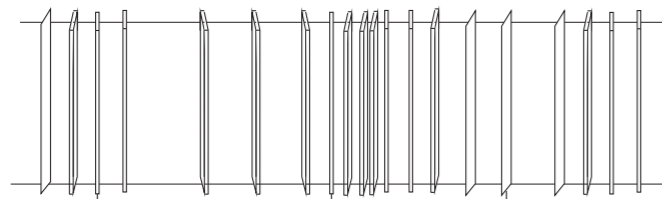
The structure sometimes transforms into a ceiling - to provide shelter. When there are lots of snow, one can climb up and be on top of them - or still hide underneath. The distance between the planks vary so that the snow will stay on top of the structure in some places while falling in between in others. This can result in interesting spaces created by the snow itself like shown in the snow changes spatiality study and the snow stacking study.



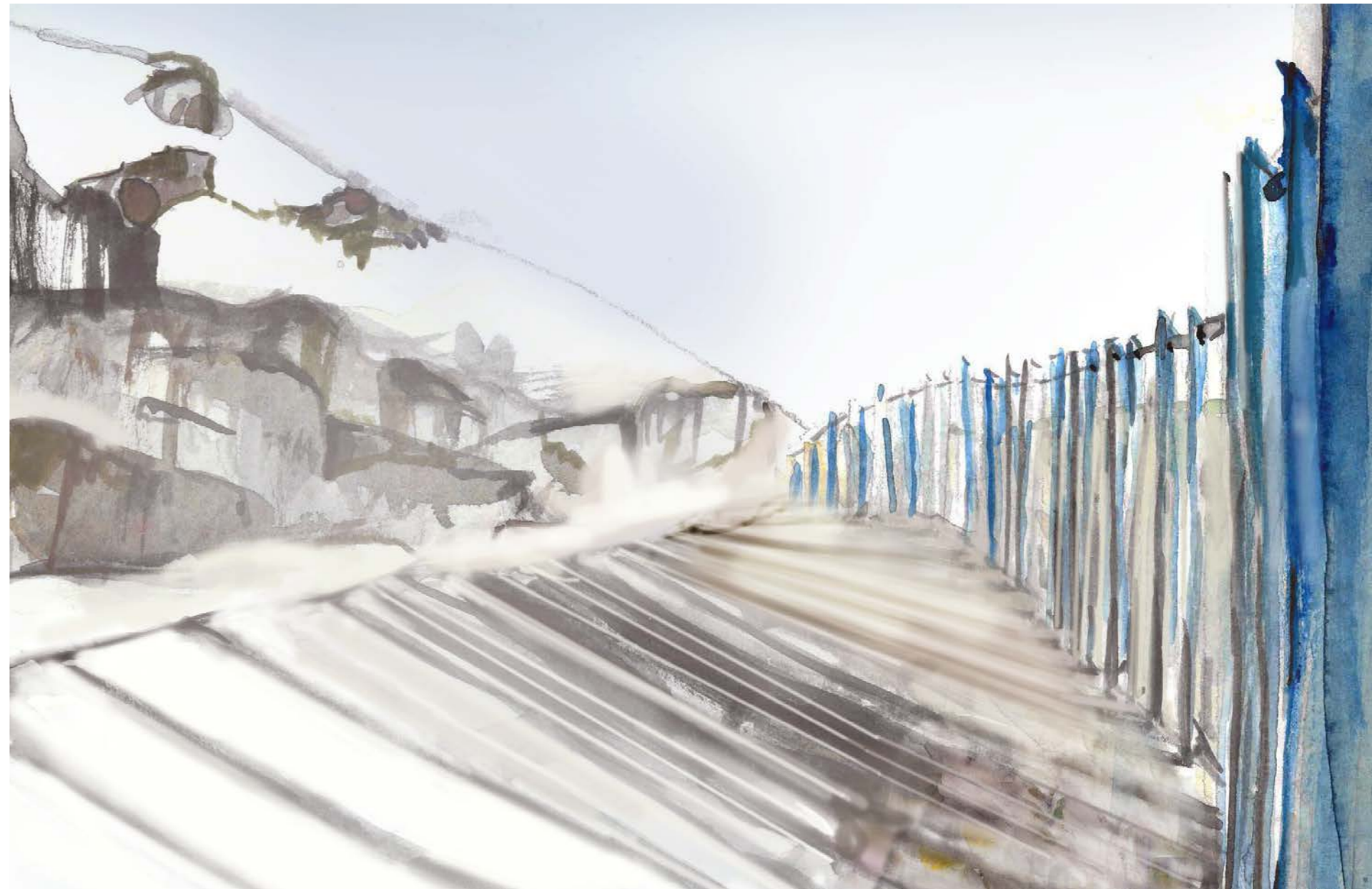
Light and Shadow

The planks become higher in some parts and almost create walls because of the closeness between them. The angle of every individual plank also varies.

The effect of this will be a walking space where one can experience the long cast shadows that were explained in the light studies. It is also inspired by the slender vegetation which is described in the layered views: valley study.



The planks have different angles



Conclusion / Discussion

The movement heritage

This thesis is investigating how architecture can preserve and promote the movement heritage of the Swedish mountains. The movement heritage is a term that tries to capture the cultural and natural heritage through the movement within it. The purpose of this is to increase the status of the Swedish mountain areas as these are often looked on as unused territory, which they demonstrably are not.

Northern Sweden is a debated area; there are natural resources that could benefit Sweden economically while climate change and extensive tourism is threatening the area. -When discussing fjällen, something that seems to be forgotten is the impressive landscape and the culture within it. The reason for this is that there is little visible trace of human history in the Swedish mountains. This is why the promotion of the movement heritage is of importance.

Culture

In the Swedish mountain areas, Samis, tourists and researchers have managed to co-exist quite well in the past, which is something worth preserving and being inspired by. Their mountain lifestyle can be described as a culture of mobility. There is some discreet trace of this culture, elements that are made by humans that might not be of great importance themselves but together they paint a picture of this multilayered cultural area.

Nature

The Swedish mountains offer great nature, which is arguably best experienced when traveling through the landscape. One can assume that passing these multiple sceneries and effects makes one appreciate and value fjällen, because of their beauty and impact. This thesis brings up three different themes of the mountain sceneries: light, views and colour. The light in fjällen creates different effects like shadows, sunsets, aurora etc. The views are extensive and often breathtaking while showing the textures and shapes of the landscape. The colours contribute to the characteristic melancholic experience of fjällen.

There is obviously more to the natural experience than these three subjects, such as flora and fauna, water, temperature and other things perceived by other senses, which would be interesting to take into consideration as well. But from the architectural point of view, light, views and colour seem like basic spatial qualities to work with.

A changing landscape

All these natural phenomenons are affected by seasonal changes and weather. Fjällen is a constantly changing landscape. Humans have adapted their culture to this, which

means that nature, culture and movement are all connected. The architectural point of view has the possibility to connect context and culture to human infrastructure, which can be beneficial when promoting the movement heritage.

Nature and human elements

Landscape is a configuration of human elements and nature. But if the balance is not thought out, one might under-value certain areas. This is something architecture can change. The studies made in the design process chapter show that human elements can create interesting spatial effects together with nature while still serving as functional structures. These findings can be used in the promotion of the movement heritage, as one can control movement, visual connections and experience of certain effects. This is the base for the design proposal of the augmented trail.

The augmented trail

The design proposal is a trail - a crucial movement heritage attribute. The trail takes one along different experiences of fjällen and articulates light effects, colour and views. It is carefully balanced with the shape of the mountain, standing out as the human element that it is out but still adapted to nature.

The structure is a reflection on how humans have used fjällen; walking through different sceneries, passing culturally important spaces, reaching peaks and finding good resting spots and shelter. The structure articulates these activities and is thereby promoting the concept of movement heritage. It is made out of the simplest plank as many other structures in fjällen are. That means that if it decays in the future, it will not leave a big mark in the landscape. It will be a new discreet trace of human activity, preserving the movement heritage. The moments of decay and the structure's future merging with nature is not a focus of this thesis, but is something that could be interesting to explore further.

Architectural enhancement

A walk along the structure could wake thoughts on human presence as well as making one notice natural effects in the mountain landscape. Thereby one gets to reflect on the many layers of the movement heritage. The design aims to connect to several of these layers.

As mentioned in the Movement Heritage chapter, the people acting and living in the Swedish mountains already understand the concept of the movement heritage, and for them, this structure can be a reminder of it. People from outside the area will get an experience of the movement heritage through the structure's articulation and existence

and thereby reflect on it. This can then lead to understanding of the movement heritage, which in turn will create validation of it and best of cases a preservational attitude.

When designing in fjällen there are a lot of aspects to take into consideration, which is described in this thesis. One of the main arguments found in the design exploration is that architecture can increase the status and experience of a natural space if adapted to it in a considerate way. Creating a feature made by humans that stands out in a beautiful landscape can seem provocative, but it has the possibility to make it better, and like in this case, articulate space to remind us that this place is valuable.

Till Sverige,

Jag fanns när ni kallade mitt land obebott.
Jag fanns när ni drev mitt folk från deras hem.
Jag fanns när ni skövlade min skog.
Jag fanns när ni grävde upp min jord för järnmalm.
Jag fanns när ni skrev er del av historien.
Jag finns.

Ser du mig nu?

/ Rörelsearvet

Text by Klara Hedberg

To Sweden,

*I existed when you said my land was uninhabited.
I existed when you pulled my people out of their homes.
I existed when you cleared my forest.
I existed when you dug my soil for iron-ore.
I existed when you wrote your part of the history.
I exist.*

Can you see me now?

/ The Movement Heritage

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Images

Dartmoor Wind Circle 1985 by Richard Long picture from Careri, F. (2009). Walkscapes: Walking as an aesthetic practice

Riverbed, 2014, Eliasson, O. Louisiana Museum of Modern Art, Humlebæk, Denmark (2014) Photo: Anders Sune Berg

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