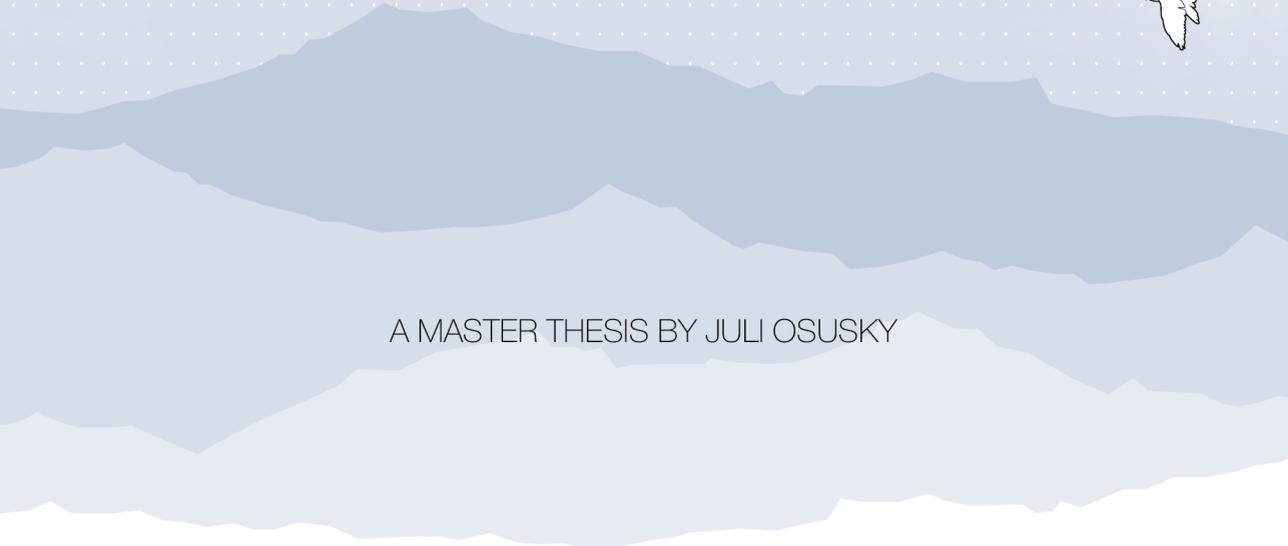# WATER CULTURE LANDSCAPES IN THE ALPS

TOWARD MORE-THAN-HUMAN FUTURES IN THE LUMNEZIA VALLEY

A MASTER THESIS BY JULI OSUSKY

Does not science teach us more and more emphatically that nothing which is natural can be alien to us who are part of nature? [...] The whole universe, from the stars and the planets to the mountains and the insects which creep about their roots, is but a network of forces eternally acting and reacting upon each other.

Leslie Stephens, 1896, p. 180

Water Culture Landscapes in the Alps
Toward more-than-human Futures in the Lumnezia Valley

Masters Thesis in Urbanism 2024-25
Thesis Report
June 2025

Juli Osusky
student number: 5789281

Studio Transitional Territories

MSc Architecture, Urbanism and Building Sciences
Urbanism Track
Department of Urbanism
Faculty of Architecture and the Built Environment
Delft University of Technology
Delft, The Netherlands

First Mentor:
Dr. Luisa Maria Calabrese
Section of Urban Design, Department of Urbanism, AB+E, TU Delft
Second Mentor:
Dr. Nikos Katsikis
Section of Urban Design, Department of Urbanism, AB+E, TU Delft

Figure 1 cover: View of Piz Aul from Ilanz, Switzerland
Figure 2 opposite: the town of Vals, Switzerland.
Figure 3 on page 7: snow cannons at Triel, Lumnezia
Figure 4. on page 9: View of the Alps from Lake Zurich (Roland zh, 2010, under CC-BY 3.0 licence)

Abstract

The Alpine territory faces converging anthropogenic urgencies: climate change, biodiversity loss, intensified agriculture, and tourism development. Together, these forces drive processes of defuturing, deterritorialization, and extended urbanization, eroding the socio-ecological resilience of Alpine culture landscapes. This thesis investigates how more-than-human communities in the Alps can reclaim agency under shifting climatic and hydrological regimes, by embracing water as a territorial, ecological, and symbolic actor within the culture landscape.

Set in the Lumnezia Valley (Switzerland), the research adopts a research-by-design methodology. Conceptually framed by Latour's Parliament of Things, Nature is reconceptualized from a resource to a partner. Through mapping major and minor stories, and a systemic analysis of actors and processes, the work reveals the Alpine landscape as co-constructed by human and non-human agencies.

The core design proposal—the Water Garden—is a multi-scalar, adaptive system that positions water as a structuring medium of care, maintenance, and culture. Paired with a refuturing framework based on ontologies of care, multispecies commons, and alternative modes of exchange, the Water Garden becomes a prototype of the planetary garden: a model for situated, relational co-existence.

The main finding of the thesis is that agency in Alpine territories is already distributed, but largely unrecognized. Through relational, water-attuned design, urbanists can contribute not by imposing futures, but by scaffolding frameworks of care and emergence, enabling more-than-human communities to actively participate in shaping their own shared, situated, and plural futures.

Keywords: Refuturing, Parliament of Things, More-than-human, Care, Planetary Garden, Alps, Lumnezia Switzerland

Motivation

My relationship with the Alps runs deep and is at the same time quite complicated. As a child growing up in Switzerland, I – like many others – went on skiing holidays every year, to the same town, in the same hotel. The snowy peaks and little villages underneath were a part of my childhood, though I only saw them through the eyes of a visitor. Now living abroad in a famously flat country, I miss them, and whenever I visit home I'm overjoyed when I see them again. From our living room window we would see the white peaks sometimes blending in with the clouds, sometimes thrusting into the deep blue sky, sometimes fiery red in the evening sun. They define my horizon and remind me of the scale of my life and my place in the world.

Growing up in the Zurich suburbs in a comfortable, middle-class household, I benefited from the freedoms, stability, and quality of life that Switzerland is globally known for. My father arrived as a political refugee from Czechoslovakia in the 1960s, my mother a blue- and I was raised with values of independence, critical thinking, and access to good education. Attending ETH Zurich for my undergraduate studies, I only gradually began to understand what that means—and how it's perceived by my peers abroad. At TU Delft, I came to appreciate what does in fact work well in Switzerland, even as Swiss people are famously modest about their privileges and will always find ways to complain about the smallest of problems.

And yet, not all is well. The greatest wealth of Switzerland, in my view, lies not in its institutions or economy, but in its natural environment, particularly the Alps. Two-thirds of Swiss territory is mountainous, and the Alps host immense ecological diversity, cultural traditions, and they perform important climatic functions across the continent. They store and regulate water, shape local weather, and host countless species and traditional practices. They are not simply majestic backdrops or touristic assets—they are living spaces of nature and culture.

Today, these mountains are under threat. The climate crisis is warming Alpine territory faster than the global average, leading to dying glaciers, biodiversity loss, permafrost melt, and increasing environmental hazards. As snowlines retreat, tourism economies face collapse, and the political response has largely been extractive—replacing lost glaciers with hydropower projects, viewing the "empty" Alpine space as available for exploitation. This mindset—what Diener et al. (2005) called the Alpine fallow land—frames the Alps as unproductive, waiting to be put to use. I question that. Are these landscapes really empty? And if not, who and what already inhabits them?

In this thesis, I position myself as an urbanist-in-questioning. I ask how urbanism—as a discipline concerned with the production of space—can engage with the web of life it intersects with, including both human and more-than-human actors. Inspired by thinkers like Anna Tsing, Maria Puig de la Bellacasa, and Gilles Clément, I explore how spatial practitioners might approach design not as imposition, but as negotiation, attunement, and co-production with living and non-living entities.

This thesis is my attempt to enter that conversation. It asks: What imaginaries guide our actions in the Alps today? How can we reclaim values of reciprocity, care, and respect that are already embedded in cultural landscapes? And how might design practices help us forge futures that do not seek to dominate the Earth—but to live with it?

Acknowledgements

Contents

Introduction

The Alps, a Culture Landscape

When Titan's first ray gilds the summit snow
And his blissful gaze subdues the mists,
Thus what Nature forms most splendid,
With ever new delight from a mountain beheld.

Albrecht von Haller, Die Alpen, 1729

The Alps as Nature's grand theatre – sublime, remote, untamed. A place of Nature, of spiritual and aesthetic transcendence. Die Alpen, a poem by Albrecht von Haller from 1729 is one of the earliest works romanticizing the Alps, in contrast to the ills of civilized life in the low lands. With the advent of the renaissance in Italy in the late 15th and 16th century, scholars and artists from all over had to cross the mountain range at the centre of Europe to get there. Soon, descriptions of alpine travels began to circulate, at first decrying the arduous journey, but soon turning to the sublime beauty of the mountains.

From the beginning of romanticism to today's tourism campaigns, social media, film and television, the sublime imagery of this space of Nature persists, frames for the gaze of outsiders to be consumed. To be admired, climbed, skied, or preserved; vacation postcards, not lived environments. But it is not Nature alone, but the humans and non-humans living and shaping in the Alpine territory, that make these imaginaries possible. The face of the Alps are not just spaces of Nature, but of culture, too.

Humans have been living in the Alps since 40,000 to 100,000 years ago (Pauli, 1980). Earliest traces of pasture agriculture in the high altitudes dates back over 6000 years (Gilck & Poschlod, 2019). Human occupation of the mountains has altered the territory manyfold. Grazing livestock, cows, goats, sheep, even horses, need grasses, not trees. So humans have cut down many

Figure 5. (previous spread) The Alps in Europe. From (ESRI, 2024)

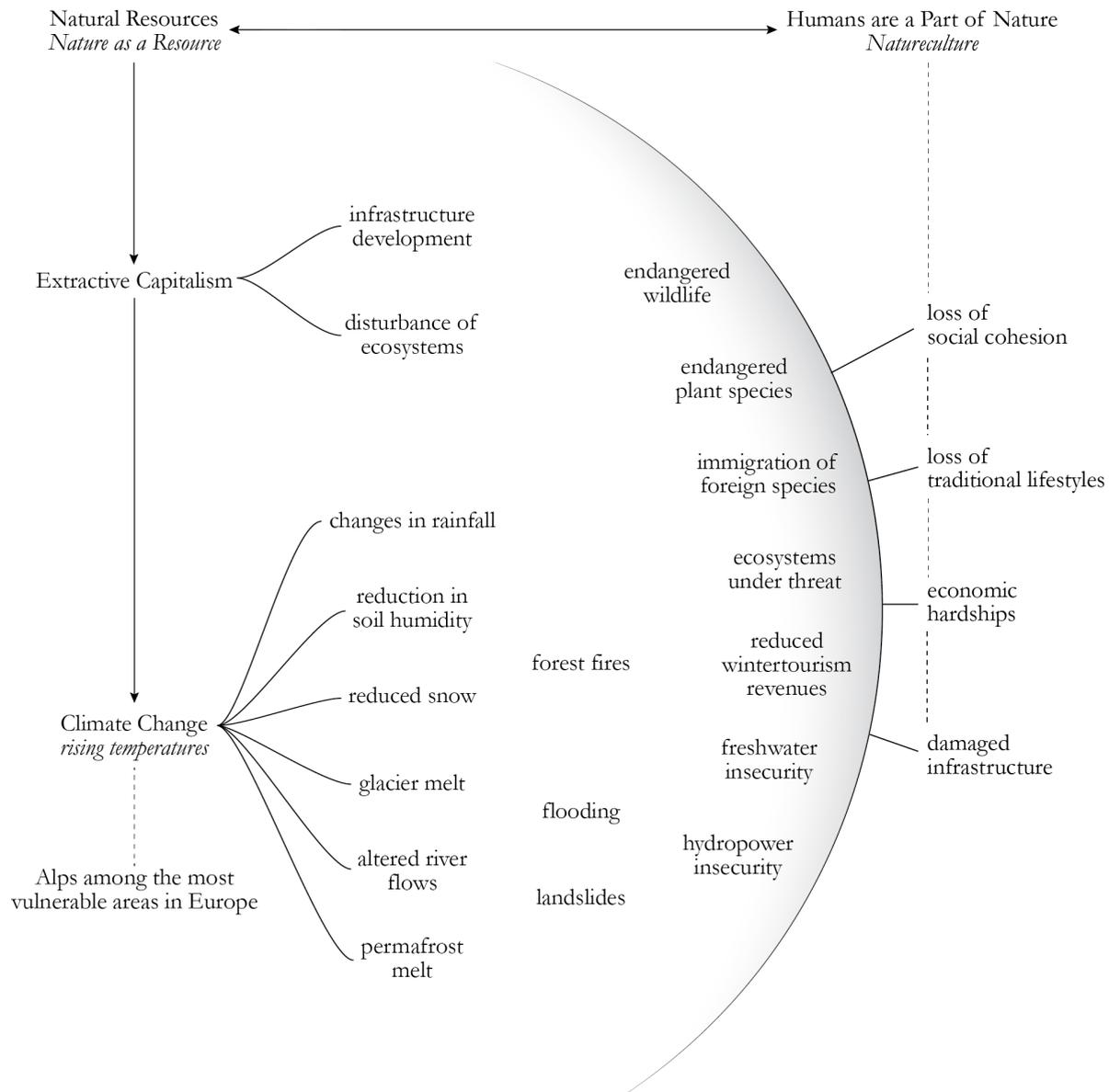Figure 6. The village of Lumbrein, in Lumnezia, Switzerland

forests in the Alps a long time ago, which has changed Alpine ecosystems to what they are now: ecological gemstones full of plant and animal life (Pornaro et al., 2021) which could not flourish in a dark, dry, nutrient-poor forest environment. Alpine meadows and pastures are human made, maintained by grazing animals, home to hundreds of species, and emblematic to the image of the Alpine landscape. This landscape has a name in German, die Kulturlandschaft, translatable as 'cultural landscape'. In this thesis, I use the slightly distinct term culture landscape, to signify that the Alps are not a landscape shaped by culture, or vice versa. In fact, culture and landscape shape each other, they are interdependent concepts. Over generations, the Alps have become a material and symbolic product of interaction between people, animals, plants, terrain, water, and climate.

The retreat of glaciers after the end of the last great ice age 11700 years ago made human settlement possible. To this day, the agency and creative power of the water and the cryosphere can hardly be overstated. The ice sheet, up to 2 kilometres thick, carved valleys out of the rock, created the lakes around the edges of the Alps, and deposited rich and fertile soils throughout Europe. Their descendants are still here in the form of glaciers, but they are slowly disappearing.

The Alps have been described as "the water tower of Europe" (European Environment Agency, 2009), the Rhine, Inn (Danube), Po and Rhone spring from the mountains, sustaining millions throughout the continent. They pose significant barriers to moisture-rich winds from the oceans and thus feature some of the highest precipitation rates in Europe, storing large amounts of water in snow packs and glaciers.

At the same time, the upstream area of Europe is also its hinterland. While 14 million people live in the Alps, they are also marginalized in their respective countries, exposed to increasing natural hazards caused by the climate crisis, sensitive ecosystems degraded because of large-scale infrastructure development. They are exposed to economic instability from a large-scale restructuring of the agricultural sector, losses of other economic opportunities, depopulation, and on top of that romanticists like Albrecht von Haller and modern touristic narratives who focus on the natural sublime and thus marginalize the socio-ecological realities of the mountain dwellers.

Figure 7. Culture Landscape in the Bernese Alps, Switzerland

Natural Resources
Nature as a Resource

Humans are a Part of Nature
Natureculture

Extractive Capitalism

infrastructure development

disturbance of ecosystems

endangered wildlife

endangered plant species

loss of social cohesion

immigration of foreign species

loss of traditional lifestyles

changes in rainfall

reduction in soil humidity

ecosystems under threat

economic hardships

forest fires

reduced snow

reduced wintertourism revenues

Climate Change
rising temperatures

glacier melt

flooding

freshwater insecurity

damaged infrastructure

altered river flows

hydropower insecurity

Alps among the most vulnerable areas in Europe

landslides

permafrost melt

From Landscape to Inquiry

The Alps, understood as a culture landscape, are a result of long-term co-creation between ecological more-than-human processes and human agricultural practices. While glaciers, rivers, and tectonic movements shaped the physical contours of the mountains, settlement, agriculture, and cultural imaginaries have produced the Alpine territory as it is experienced and governed today. Yet this is a territory in transition. The conditions that allowed the culture landscape to emerge over centuries are now rapidly shifting – stable climate, seasonal rhythms, locally situated practices are increasingly under pressure. Anthropogenic climate change, caused by industrialization and enforced by capitalism, urbanization and infrastructure development, neo-liberalism and the selling-out of democracies all play their part.

While Europe as a continent faces less severe global warming than other geographies, the Alps are warming at nearly twice the global average (Calvin et al., 2023; Kotlarski et al., 2023) and have already warmed 2 degrees compared to 1850 (CIPRA, 2012). This has direct consequences for the cryosphere with glaciers projected to melt completely (Huber et al., 2024; Kissling, 2021; World Glacier Monitoring Service (WGMS), 2023), for hydrological cycles which see increasingly intense weather events while overall drought risks increase (CREA Mont-Blanc, n.d.; Kotlarski et al., 2023), Alpine biodiversity which sees many species endangered and going extinct (Klaus et al., 2021), and human livelihoods which become untenable (Cabalzar, 2024; Corradini et al., 2023). Mountain glacier retreat and receding snowpacks threaten the water security not only of mountain communities but also of downstream populations (Viviroli et al., 2019).

Climate-related and economic urgencies facing the Alps are inextricably linked, as Corradini et al. show (see Figure 8). Rising temperatures and thus reduced snowfall in a ski tourism destination mean economic hardships and loss of perspectives. Dryer summer months, intense weather events and ensuing landslides endanger the future of pasture farming. If the traditional practices can't be upheld, because economic and ecological pressures force the agricultural sector to consolidate and rationalize, the way humans and non-humans interact, care, and maintain the culture landscape becomes under threat. If these pressures become too great, people see no choice but to emigrate, hollowing out the community. The destinies of Nature and humans are ever intertwined, everywhere, but especially in mountain regions.

Figure 8. Urgencies facing the Alps.
Based on (Corradini et al., 2023, pp. 16-17)
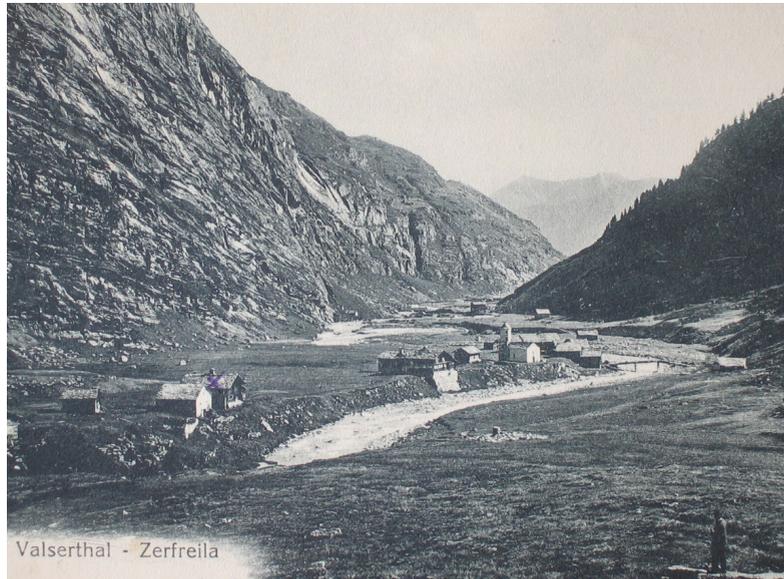
Valserthal - Zerfreila

Figure 9. Zerfreila in Vals, Switzerland: now a power station, flooding the historic settlement of the same name. Left image: (Maggi, 1921), Right image: own work, 2024.

Living in the mountains has always been hard, throughout history. While mountain life may seem idyllic at first glance, the isolation of alpine villages, the rough terrain and short growing seasons, and harsh winters has left mountain dwellers in precarious situations. They adapted to living in the mountains by adopting small-scale agriculture and communal alpine farming practices. The system of summertime pastures allows cows to graze on more land, giving meadows at lower elevations more time to grow. Meanwhile, alpine cooperatives pool efforts and designate a shepherd who takes care of the animals while they are on the pastures, freeing other farmers to grow crops and vegetables, the produced milk, butter and cheese shared between all. Small villages have a tight social fabric: if everyone knows everyone, all have access to a pool of knowledge, labour, and materials.

The advent of modernism has, already in the 19th century, lead to social and economic hardships. For example, industrial production of fabrics in England caused the decline of weaving as a side income for agricultural families, forcing the first rationalization of agriculture and pushing many away from the fields into factories (Jung, 2020). These structural changes of the economy lead wo wide-spread depopulation of rural areas, especially in the mountains. These economic hardships pressured many people in the Swiss Alps to send their children – some as young as 12 – to work in southern Germany or Milan as household helpers. Martin Cabalzar writes, that from the population in the Lumnezia valley alone, up to 500 children would be sent to Germany over one winter (Cabalzar, 2024) – of a total population of 3000. Many didn't see any hope for the future, and thus emigrated, to the low lands, abroad, or America, some towns even paying the tickets (Altwegg & Tieber, n.d.).

We now live in another era, where economic pressures are once again threatening the livelihood of Alpine communities, this time combined with ecological pressures. Market liberalization has lead to a steep decline in the importance of the agricultural sector, the share of mountain farms is steadily decreasing (Flury et al., 2013) in tune with land consolidation and increasing mechanization and farming intensity, but also leading to widespread land abandonment – both of which has adverse effects on biodiversity calibrated in the culture landscape over centuries. The other economic pillar, tourism, is under threat because of the decline of snowfall and rising temperatures

(Bausch & Gartner, 2020; Corradini et al., 2023). This presents three options to tourism-dependent regions: investments in infrastructure to keep skiing alive, adaptation of their offerings towards less dependence on winter, or decline and give up. 15 years ago, many would prefer to invest into existing ski tourism (Hill et al., 2010). In the time since then, many skiing regions developed infrastructure for technical snow making, expanding to higher altitudes, or investigating how to harvest snow when it is available for later use. But, as Thomas Kissling asked in a personal interview for this thesis: "if we design only towards keeping skiing alive, do we not degrade the mountains to mere gym equipment?"

Many are calling for different approaches, novel ideas, new perspectives. Different systems are needed, as the old ones are not viable anymore under the new anthropogenic regime. It is, though, a question of evolution or revolution, of changing everything and doing things radically differently, or if small adjustments are needed to the old systems, which used to work just fine. Shifts are needed, but what kind of shift? The centuries-old systems of the culture landscape, the care and recognition of shared lifeworlds, the communal mentality, subsistence and sharing economies, are well-tested and have deep cultural roots in the Alps. At the same time the shifts – many of them related to water – force a reconceptualization of the culture landscape.

Figure 10. Ski tracks outside the bounds
of the ski resort Obersaxen, Switzerland

Design as Futuring (and Defuturing)

Futuring is a core aspect of design: the imagination of futures. Projections, simulations, fabulations, utopias, back-casting etc. can all fall under this term. Futuring is an inherently power-laden practice: Futuring defines what futures are possible, who may articulate them, and who stands to gain from those futures. Futuring also calls into question the linearity of the future: many design practices rely on linear, growth-oriented, human-centred timelines.

Design can also be defuturing. Tony Fry, one of the foremost scholars on the subject, defines it as "a process of negation that arrives by design, serving socio-cultural, economic and environmental forms of unsustainability that combine to diminish planetary biological futures" (Fry, 2019, p. 294). As design has a particular aim toward the benefit of some actors, the same time it doesn't serve other actors – it often leads to problems and marginalization.

Developing ski resorts is in essence a design decision of how the landscape should be used by tourists, and which infrastructures support this usage. To this end, the Naturally rough landscape of mountain pastures, with bumps and undulations, rocks and outcroppings, shrubs and trees, needs to be planed into a smooth surface for the comfort of skiers. The diversity of the pasture landscape, however, provides countless ecological niches for endangered species, which lose their lifeworld and thus their future. This is not to inherently problematize the design decision of making a ski slope, but the power of design to accommodate diverse aims and considerations. The ethics and politics of the design process can lead to defuturing for the unheard – especially if those unheard are unable to speak themselves.
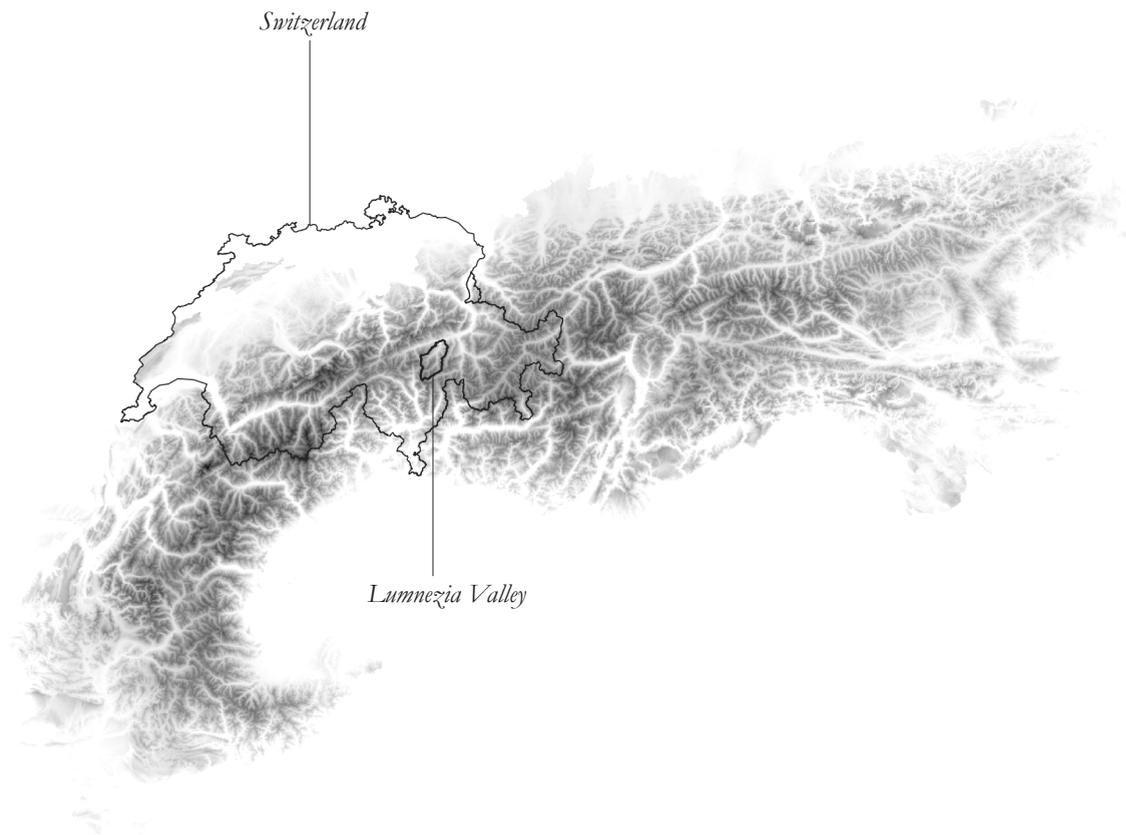
Those unable to speak are socially and politically disadvantaged people, communities, and territories. Fry writes a lot about design as colonialism. Non-humans and Nature also belong to those unheard. Nature does have very little rights, and doesn't speak about its own futures, nevertheless as part of Nature us humans need to consider Nature in design. That's why Fry also problematizes sustainability as an antiseptic concept which has been thoroughly sanitized of its ethical and political origins, and which has become a tool in the perpetuation of defuturing systems by applying de-politicized technical fixes while the core system is not questioned. He coined the alternative concept of sustainment: a cultural, ontological, and civilizational project, a shift in how we value and co-create futures (Fry, 2003).
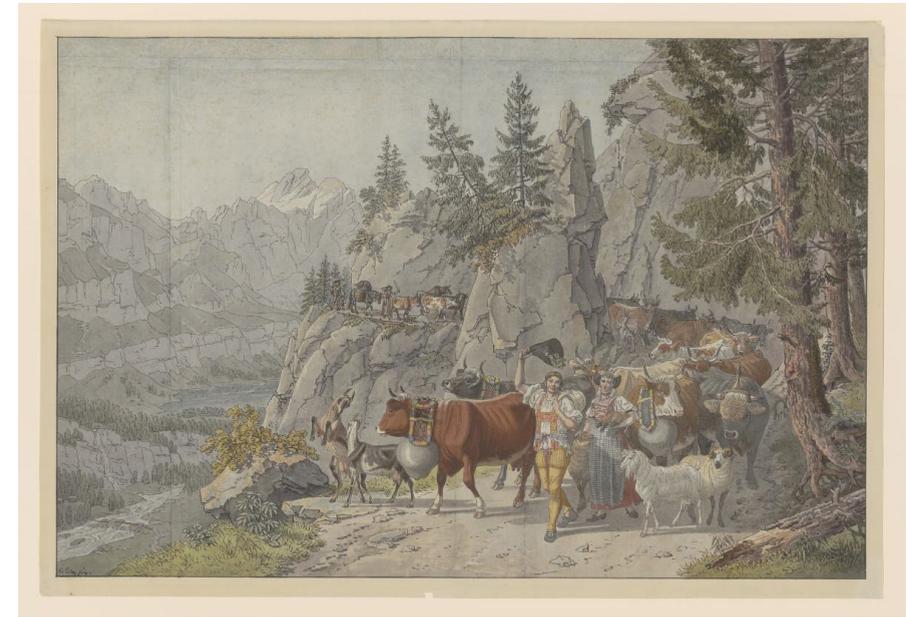
Cultivating new, entangled ways of being in the world is also what Donna Haraway calls "staying with the trouble": accepting complexity and living with uncertainty, making kin with others as a way of mutual becoming (Haraway, 2016). As a designer, this means designing for, not designing with, others. Focussing on maintenance, repair, and care, rather than innovation and progress as the attitudes of design.

Alternative temporalities need to be highlighted – the shape of the future is not a line, be it straight or crooked. Marianna Rillig finds a key distinction between lived, everyday time, and capital, linear time (Rillig, 2014). Alpine rhythms of daily practices and seasonal processions have deep roots in the traditional pasture agri-culture. Everyday time doesn't have to be strictly circular, progression still happens, but it is an understanding of forward and backward consequences of actions, of seeing the future in the past, or the past in futures. Design as Futuring can learn from the Alpine cultures in seeing the future not as a place, but as an emerging practice.

Figure 11. Alpabzug in Appenzell: the annual descent of cows from their summer pastures. Described as a melancholic event, the animals and shepherds are richly decorated to lift the spirits and to remind of the ascension the coming spring. From: (Lory, 1811).

Switzerland

Lumnezia Valley

The Case: Lumnezia Valley

This thesis is not purely theoretical. It intends to explore the concept of futuring through practice – research by design. What does it mean, to be entangled, with whom? What processes are shaping the future of the Alps? How can design focussed on maintenance and care look like? These are questions that can be explored in space, and to embed myself as a designer into the Alpine territory, my partner in crime is the Lumnezia valley in Switzerland.

The Lumnezia valley, part of the Surselva region in south-eastern Switzerland, seems at first glance to be a random valley, among many others. And in essence, it is a normal valley. At the same time, it is made unique by the local specificities that are not found anywhere else in the Alps.

The valley is formed as a part of the Adula massif, from which the Rhine springs, carved out of the rock by glaciers. The geological composition of the valley sides predispose the area for wetlands on the slopes of the mountain. Where glaciers once were, soil takes the responsibility of storing water.

The valley is large, and small at the same time. It covers some 300 square kilometres, but is inhabited by just 2000 people, who live in a string of villages along the western slope. It is a typical culture landscape, pastures and meadows, with small barns and stables dispersed across the mountain face (see Figure 14). The history of the villages and culture landscapes date back at least 1400 years, and the local culture features rich traditions of music and fables, preserved in the local language of Romonsh Sursilvan.

While the valley is culturally and historically rich, as part of Switzerland it exists at the margins. In their landmark study on the landscape typologies of Switzerland, the group around Jaques Herzog and Pierre De Meuron at ETH Studio Basel classified the valley as Alpine fallow lands: "zones of decline and gradual recession. Their most common feature is steady emigration" (Diener et al., 2005, p. 930). When I initially read this description of fallow lands I rejected the idea of dismissing values that are not measured in economic terms, a fallow land is also a land in recovery, where the soil is alive with activity and maintenance, the keeping of a fallow land as an agricultural practice of care for the land.

Figure 12. Location of the Lumnezia Valley in Switzerland and the Alps.

Figure 13. Lumnezia valley, looking south, Pez Terri on the horizon.

Figure 14. A barn on a summer pasture in Lumnezia, above the village of Vella.

Trajectory of the Thesis: From Problematization to Proposition

Approaching Lumnezia, and going toward the design, I structure the thesis along the decolonial posthumanist research method that Sundberg (2014) proposes: a three-step movement *locating the self*, *(un)learning*, and *walking-with*.

Ones own position as a researcher needs to be established to be able to understand the positions and relations of others. Research in this framing is a reciprocal process, changing both the researcher and their subject. As this thesis deals with research by design / design by research, acknowledging this reciprocity seems the obvious thing to do. *Locating the Self* as part 1 of this thesis thus aims to establish the researchers gaze upon the subject.
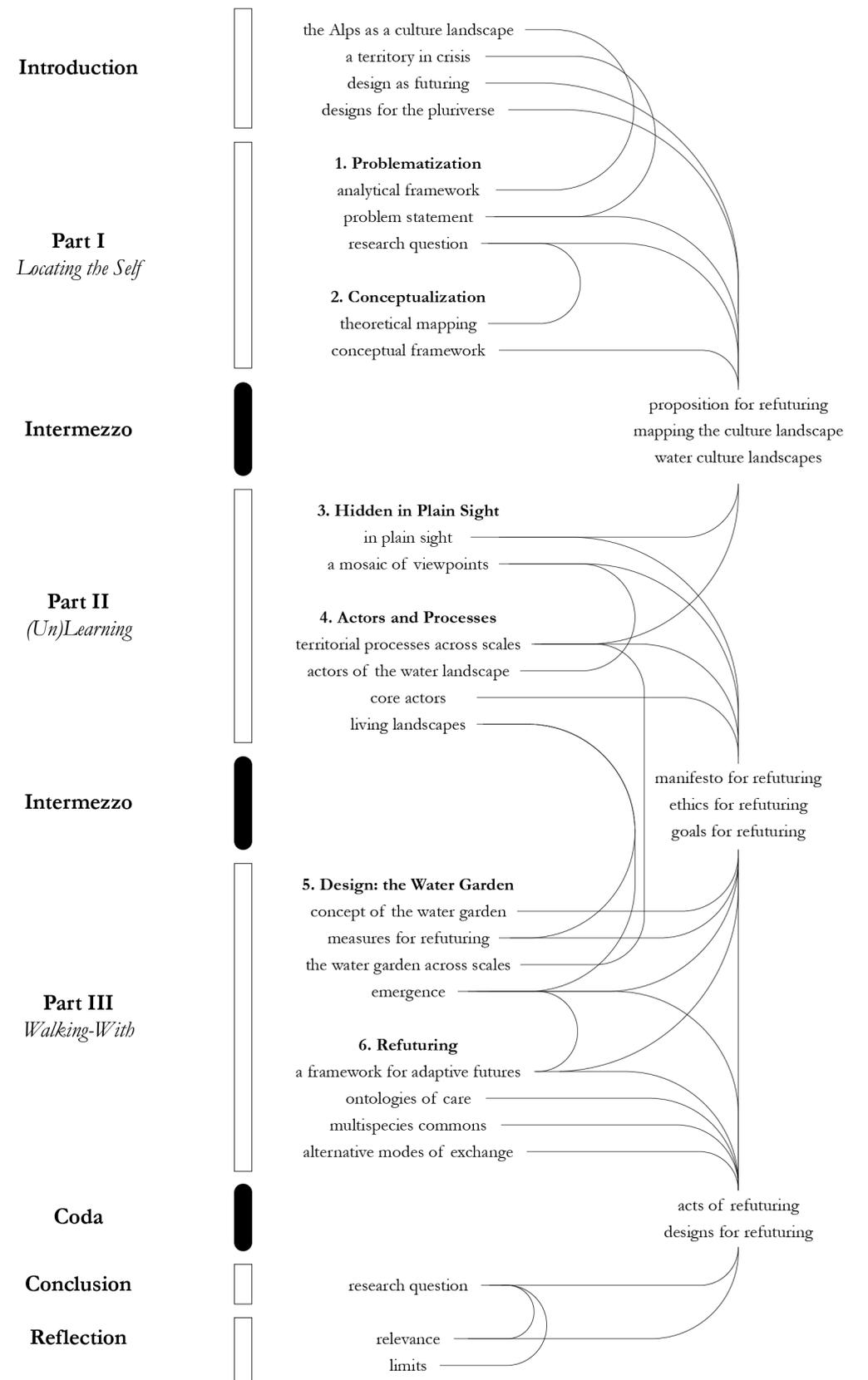
Part 1: Locating the Self

Chapter 1, *Problematization*, approaches the Alps as a territory whch can be seen through a kaleidoscopic analytical framework with the three dimensions of *land*, *life*, and *imaginaries*. Individually, they tell stories of the territory. Together they allow reflections upon themselves to create emergent properties and meta-themes within the analytical framework. Out of this emerges the realization of defuturing as a sociotechnical process in the Alps, which impacts all dimensions of the territory. Related phenomena of extended urbanization processes and the movement of deterritorialization through labour and money flows lead into the problem statement: The Alpine space is being defutured, the agency of the more-than-human communities are thus under threat. Water, which has always been the driving force of the land- and life-making processes, becomes a critical factor in the future of the Alpine culture landscape. The research question establishes the direction:

> How can more-than-human communities in the Alps reclaim their agency under changing climatic and hydrological regimes through embracing water in the culture landscape to take an active role in their own refuturing, illustrated by the case study of the Lumnezia Valley, Switzerland?

This main question opens up a number of subquestions, which may guide the further investigation and design considerations: What are the main processes of defuturing and deterritorialization of the Alpine territory and the Lumnezia Valley? Which actors and processes co-construct the water

Figure 15. Structure of the thesis, based on the steps locating the self, unlearning, and walking with, by (Sundberg, 2014)

Introduction
- the Alps as a culture landscape
- a territory in crisis
- design as futuring
- designs for the pluriverse

Part I
Locating the Self

1. Problematization
- analytical framework
- problem statement
- research question

2. Conceptualization
- theoretical mapping
- conceptual framework

Intermezzo
- proposition for refuturing
- mapping the culture landscape
- water culture landscapes

Part II
(Un)Learning

3. Hidden in Plain Sight
- in plain sight
- a mosaic of viewpoints

4. Actors and Processes
- territorial processes across scales
- actors of the water landscape
- core actors
- living landscapes

Intermezzo
- manifesto for refuturing
- ethics for refuturing
- goals for refuturing

Part III
Walking-With

5. Design: the Water Garden
- concept of the water garden
- measures for refuturing
- the water garden across scales
- emergence

6. Refuturing
- a framework for adaptive futures
- ontologies of care
- multispecies commons
- alternative modes of exchange

Coda
- acts of refuturing
- designs for refuturing

Conclusion
- research question

Reflection
- relevance
- limits

culture landscape? And how can an Urbanist set a framework for pluriversal autonomous design in the Alps?

Establishing what the researcher perceives is only one half of locating the Self. Chapter 2 *Conceptualization* frames the thesis in a theoretical map and conceptual framework. Relevant and additional literature is discussed, and the most important relationship is explored: the relationship between Nature and humans, from seeing Nature as a resource, to find a partnership with Nature. Conceptually, the parliament of things by Bruno Latour (1993) is the frame, which as more-than-a-metaphor shapes the other two parts of the thesis.

The first two chapters conclude with the realization that the design brief must adopt the perspective of the water landscape, establishing a water culture, addressing the cultural landscape. This way, other paths of Futuring, of Refuturing and be opened.

Part 2: (Un)Learning

The second step, according to Sundberg, is *(un)Learning*, which is both unlearning what the researcher presumes to know, and learning genuinely from the subject. Acknowledging that universalist knowledge is not applicable, unlearning means to question the knowledge one has and invites learning from each other. Departing from the notion of Territorialization as proposed by Raffestin and Butler (2012), unlearning here means getting to know the territory and the actors shaping it. The ways of knowing are important too: the practice of Research by Design employs a creative process of knowledge creation. In Researching Otherwise Nitin Bathla also remarks the privileging of verbal-textual methods, and the Anthropocentrism in landscape and urbanism (Bathla, 2024) as challenges to overcome in design.

Chapter 3 *Hidden in Plain Sight* approaches the Lumnezia valley first from a mainstream perspective, to then uncover the hidden, minor perspectives that matter. Taking the layer approach of landscape studies, and tuning it to the processes that don't become clear when the landscape is just viewed in two dimensions, I build a mosaic perspective of the landscape, acknowledging diverse forms of relating to the Lumnezia valley.

Contrasting the forensic-perceptive approach of chapter 3, the fourth chapter, *Actors & Processes*, is a systematic review of the actors, practices and modes, which co-construct the landscape across scales and time. I introduce the fifteen actors, human and non-human, which serve as the main stakeholders of the design. Intertwining the processes, it becomes more clear how water as an actor interacts with the other actors, forming an interdepended web of life spanning all scales. Gathering all the evidence from the two chapters, as well as part 1, a manifesto outlining the stakes the design operates with concludes part 2.

Part 3: Walking-With

Sundberg sees this step as a call to action:

> "Step three entails walking with in the sense of political engagement. I think of walking with as a form of solidarity built on reciprocity and mutuality, walking and listening, talking and doing. Walking with entails engagement with Indigenous communities and individuals as intellectual and political subjects, colleagues in the practices of producing worlds. How one engages will take a variety of forms and will be different for everyone."
> (Sundberg, 2014, p. 13)

Chapter 5 lays out the design across three scales: body, local, and regional scale. Engaging with the local actors as colleagues in the practices of producing worlds, I turn to the motif of the garden: an interstitial space between Nature and Culture, which comes together as a practice of human and more-than-human labour, maintenance, and care. So I propose *the water garden,* a space which connects the hidden agency of water to the lived experience of the culture landscape.

Finally, Chapter 6 *Refuturing* rounds off the design and the thesis as a whole. It acts both as a conclusion and a speculative prognosis of entangled pathways toward alternative futures, apart from the technoscience way of contemporary spatial planning and design. The framework for adaptive futures charts ways forward for the actors and the valley, and the Alps in general. The fallow lands are indeed the space, where life sprouts once again.

*"**Locating the self** is a tactic common to feminist methodologies to acknowledge that knowledge comes from somewhere and is, therefore, bound up in power relations"*
(Sundberg, 2014, p. 36)

Locating **Part I** *the Self*

Chapter 1

Problematization

Before the Alps become a site of design, they must first be understood as a site of inquiry. This chapter sets out to approach the Alps not just as a landscape or a physical environment, but as a territory. In doing so, it builds the analytical foundation for this thesis.

The chapter begins by engaging with the concept of territory, drawing from a range of geographical and philosophical perspectives to ask how space becomes meaningful, governed, and lived. These theoretical considerations provide the ground for a more situated analytical framework allowing readings of the Alps through three spatial dimensions: Land, Life, and Imaginaries. Each dimension, through the lenses of Composition, Alteration, and Limits, reveals different ways in which the Alps are constructed and reconstructed.

The kaleidoscopic analytical framework employed reflects Land, Life, and Imaginaries across dimensions, uncovering broader territorial processes, identifying the processes of extended urbanization, deterritorialization, and defuturing as key forces shaping the Alpine territory today.

This unfolding inquiry concludes with a problem statement and the formulation of the main research question that will guide the remainder of the thesis. In this way, the chapter moves from theoretical grounding to analytical framing, and finally toward the questions of design and agency.

Figure 16. Abandoned skilift station in
Flims, Switzerland

Territorialization

What do we mean when we use the name, *Alps*? Depending on who is speaking – and from which position – the Alps may appear as a geological formation, a political periphery, a cultural refuge, or a pristine space of Nature. These interpretations are not merely semantic; they reflect overlapping and often conflicting ways of territorializing the Alps—of understanding, inhabiting, and governing this space. They emerge as a contested and dynamic territory, shaped through material interventions, lived relations, and symbolic projections. To unpack this complexity, I approach the Alps through three interrelated dimensions: *land*, *life*, and *imaginaries*. Together, these dimensions form the analytical lens through which this thesis understands the Alps as a designed and contested culture landscape.

To understand the Alps as a territory is to see it as a eco-socio-political construct. Claude Raffestin describes territory as a relational space, as a tool as socio-spatial control emerging through the interplay of power, control, and symbolic meaning (Raffestin & Butler, 2012). It is not just the land itself that matters, but how it is inhabited, worked, and made legible to institutions and communities. Stuart Elden (2010) complements this view by framing territory as a political technology—emerging historically through techniques of measurement, classification, and legal governance. While his emphasis lies in the role of the state and calculative instruments in rendering space governable, this thesis focuses on territory as more than a product of institutional control, drawing on a relational understanding of territory, one informed by actor-network theory (Latour, 2005; Whatmore, 2002) which emphasizes that space is not pre-given but assembled through dynamic relations between human and non-human actors. As an assemblage, territory is not static, but constantly shifted and maintained by diverse actors through repeated or altered actions.

Territory is then, in summary, not only the product of labour and control (as Raffestin stipulates), but also of material and semiotic negotiation across scales. Latour's assembling makes visible the fragility and contingency of territorialization—territory is not simply claimed or governed, but continuously enacted through shifting alignments of actors, infrastructures, ecologies, and narratives. This understanding allows us to move away from viewing territory as a fixed container, and toward seeing it as a state of becoming, always in flux.

Figure 17. The Adula Massif (from Google Earth)

Analytical Framework

Building on this, I approach the Alps through the analytical lenses of Composition, Alteration, and Limits—three conditions that describe different states of being or becoming territory. Composition refers to the constitutive elements and relations that form a territorial configuration; Alteration describes the transformations—intentional or emergent—that unsettle, rework, or reinforce that configuration; Limits identifies thresholds or tensions where the territorial form may no longer persist, whether ecologically, politically, or symbolically.

To operationalize this framework, I introduce three interrelated spatial dimensions: Land, Life, and Imaginaries. These provide a structure for analysing how territory is produced and experienced across material, ecological, and cultural registers. *Land* encompasses the physical layers that shape the Alps, topography, the climate, and weather systems. *Life* captures the relational entanglements of more-than-human processes in the layers of the biosphere, land cover, food production and habitation. *Imaginaries* includes the symbolic orders that make the territory thinkable and actionable, in the layers of culture, administration, language, and tourism. Taken together, this analytical framework allows for a reading of the Alps not as a unified landscape, but as a territorial formation in tension, shaped by ongoing struggles over what the Alps are, and what they are becoming.

Importantly, this framework is not linear or compartmentalized. Inspired by the work of Metaxia Markaki (2024) who developed a similar structure in her study of peripheral Greek territories, I adopt a kaleidoscopic lens: one that reflects and refracts each dimension through the others to enable a recursive, multi-perspectival reading of territory. As these reflections accumulate, they give rise to meta-readings of the Alpine landscape—themes such as extended urbanization, deterritorialization, and defuturing begin to emerge—not as predefined categories, but as outcomes of the intersecting of Land, Life, and Imaginaries. The analytical framework, then, is both a method of observation and a tool for synthesis, enabling a situated and multi-scalar inquiry into the present and future of the Alps.
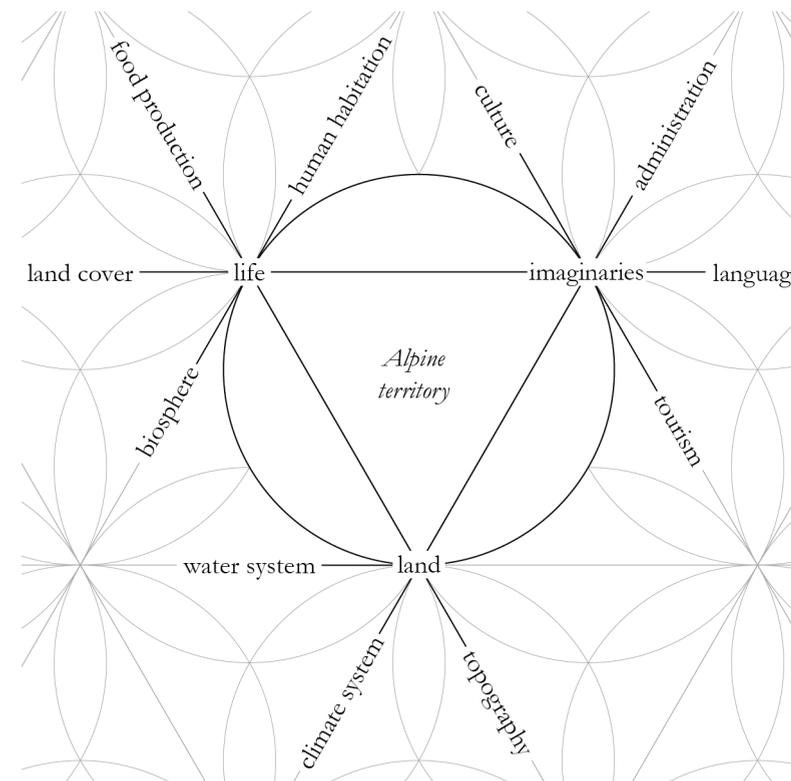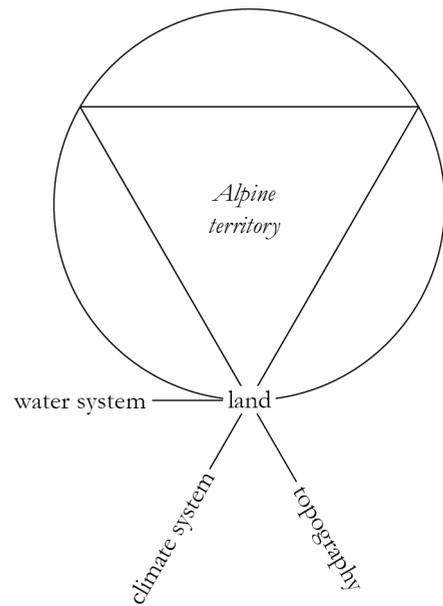

Figure 18. Kaleidoscopic Analytical Framework. Inspired by the work of Metaxia Markaki (2024).

Land: Composition

Two main forces shape the composition: tectonic uplift that gave rise to the mountains, and the hydrological systems that have sustained them. The Alps are referred to as the "water tower of Europe" (European Environment Agency, 2009, p. 13), storing large amounts of water in the form of glacier ice and seasonal snow packs. These feed major rivers, supporting ecosystems and economies across the continent. The water also constructs territory. During the last glacial maximum 18000 years ago the ice carved valleys and deposited rich soils. Current ecosystems, land uses, agriculture and tourism still follow this aquatic spatial logic. The cryosphere is not a remnant of the past, but an agent in the co-production of the Alpine territory.
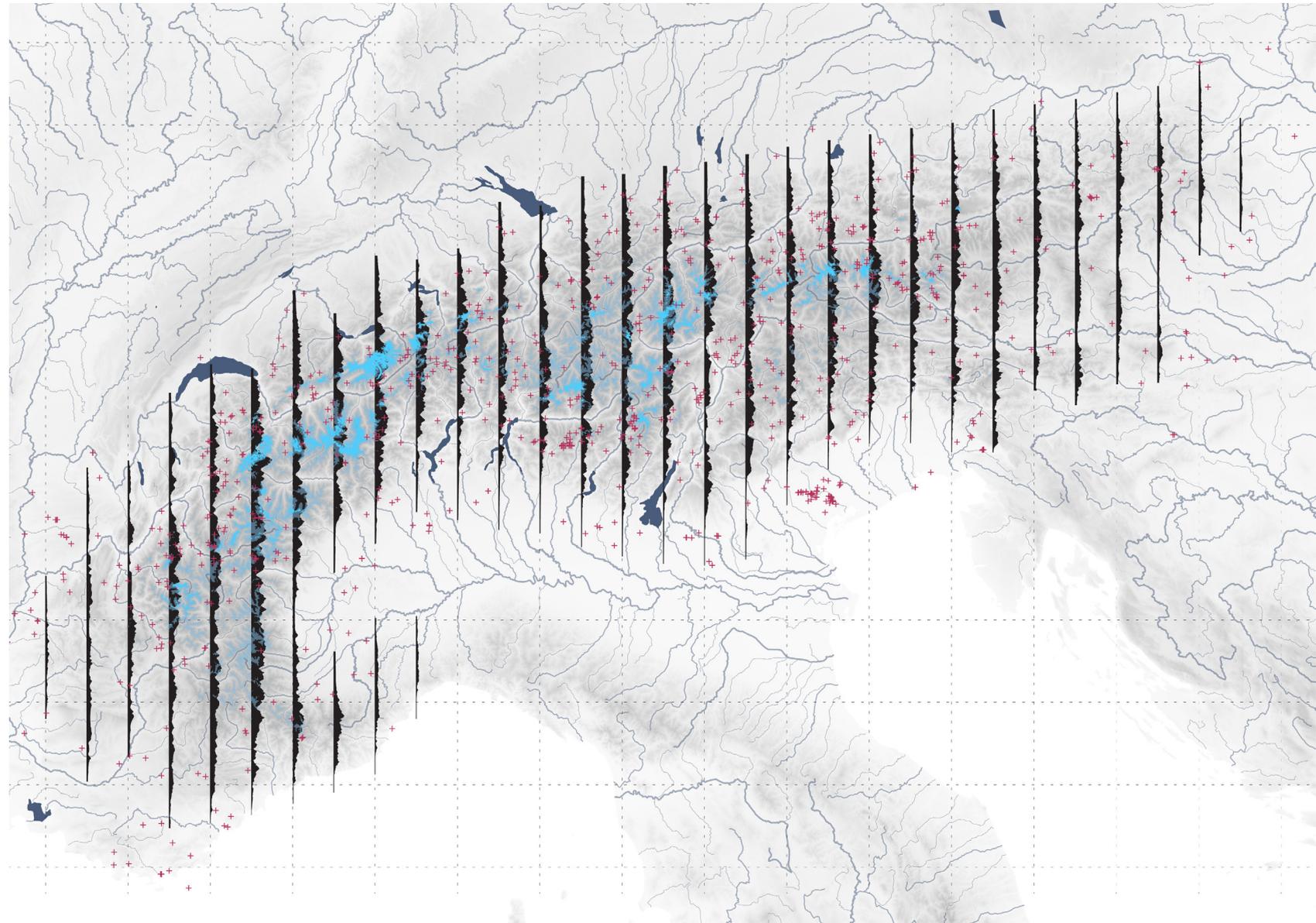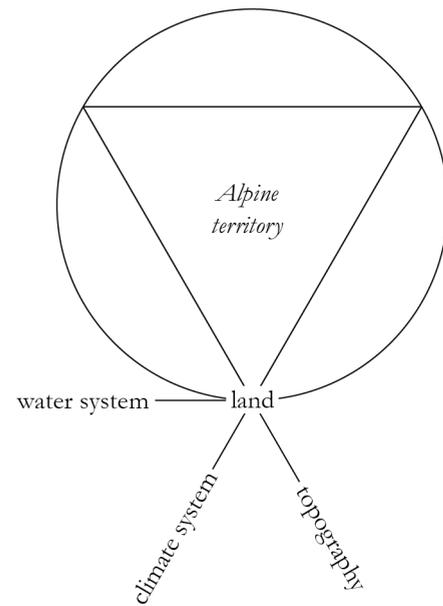
Figure 19. Land | Composition.
Hydrological Network of the Territory

1:4.500.000 —————— 100km

- glacier mass
- rivers and lakes
- dams and reservoirs

Land: Alterations

The first Alpine landscape to disappear because of anthropogenic alterations are glaciers. Comparisons with historic maps and images reveal the glacial retreat, which leads to increased water run off, making the high-alpine valleys attractive for hydropower development. The re-routing, storage, and monetization of water essentially deterritorializes the high-alpine space from a cryosphere to an operational landscape extracting energy for economic development.

Figure 20. Land | Alteration. Glacier size comparison between 1850 to today, and Zervreilasee reservoir.

Land: Limits

Glaciers need a critical minimum mass to keep their internal dynamics alive. Since 1945, when the measurement of the territory reached glaciers, their mass has decreased drastically. All realistic temperature scenarios by the IPCC will lead to their eventual disappearance (Calvin et al., 2023), undermining the spatial logics upon which not just ecological, but socio-economic systems supporting millions, are built. Historic water flows as infrastructure for life threatens to become unstable.
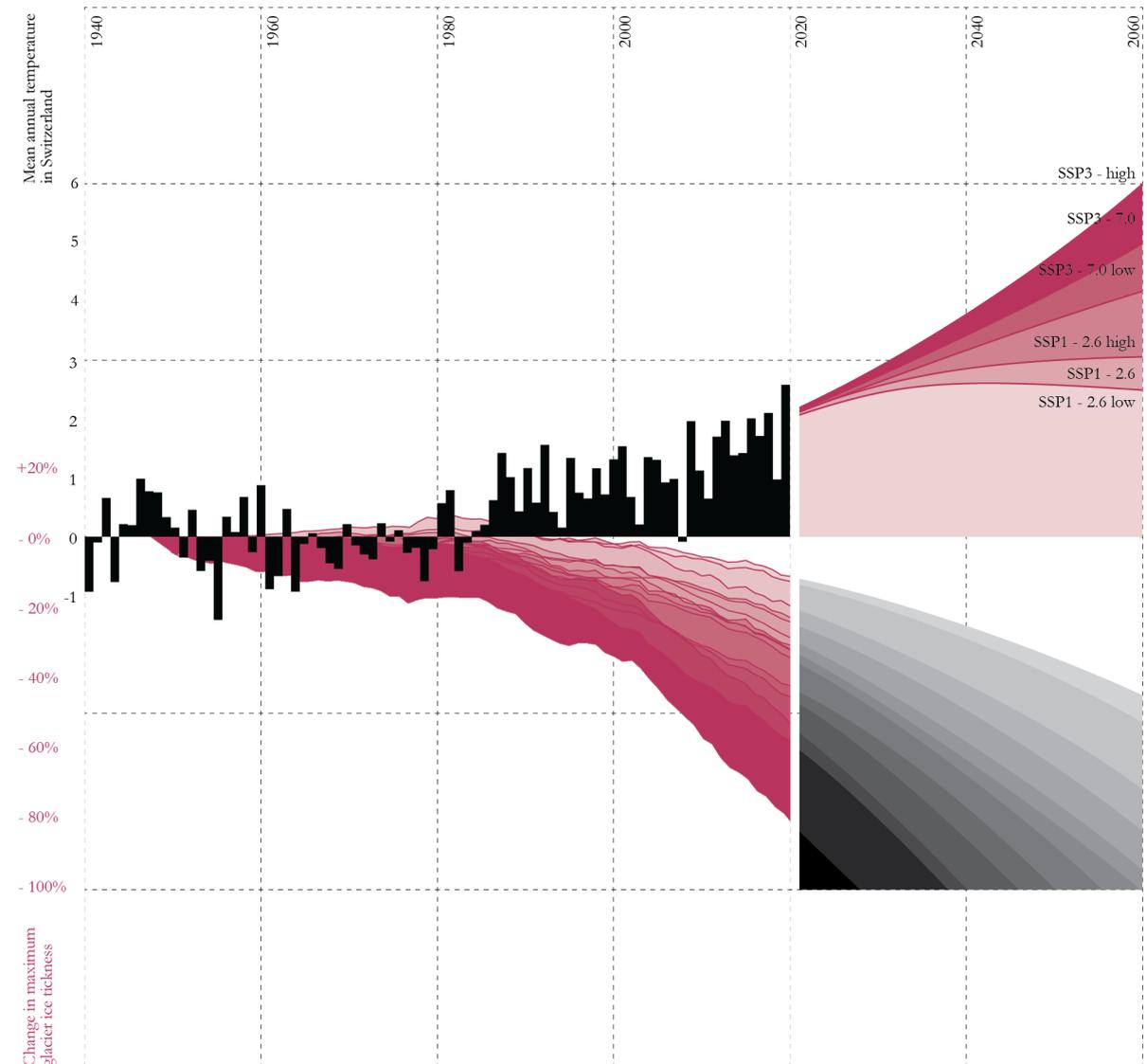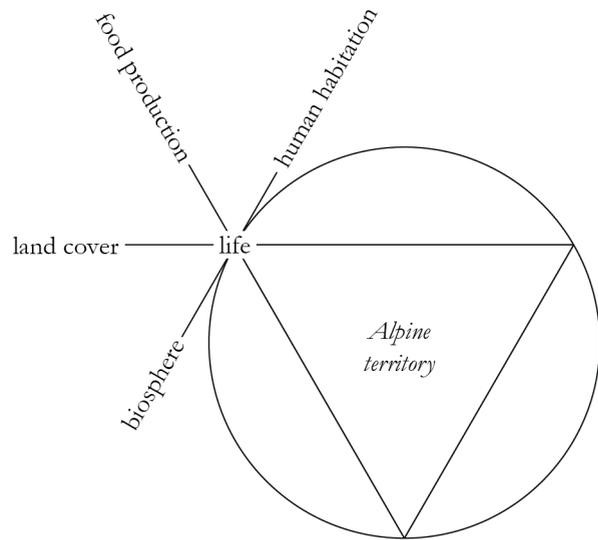

Figure 21. Land | Limit. Trend lines of mean annual temperaturesin Switzerland (top left), glacier thickness (bottom left), climate scenarios (top right), and suggested glacier melt in the future (bottom right). Based on (World Glacier Monitoring Service (WGMS), 2023, p. 73 and Calvin et al., 2023, p. 75)

Life: Composition

The Alps host 30,000 animal and 13,000 plant species (Biodiversity & Nature Conservation, n.d.) and about 14 million humans (Elmi, 2018). With their many valleys and lateral orientation creating regional microclimates, the Alps host a mosaic of diverse ecosystems, with endemic species sometimes only living on a few square metres. These ecosystems are highly sensitive to changes in water availability, as are the traditional agriculture in, and intensive agriculture around the Alps. Cores of dense urbanization at the edges of the Alps benefit from the climate and water the mountains provide.
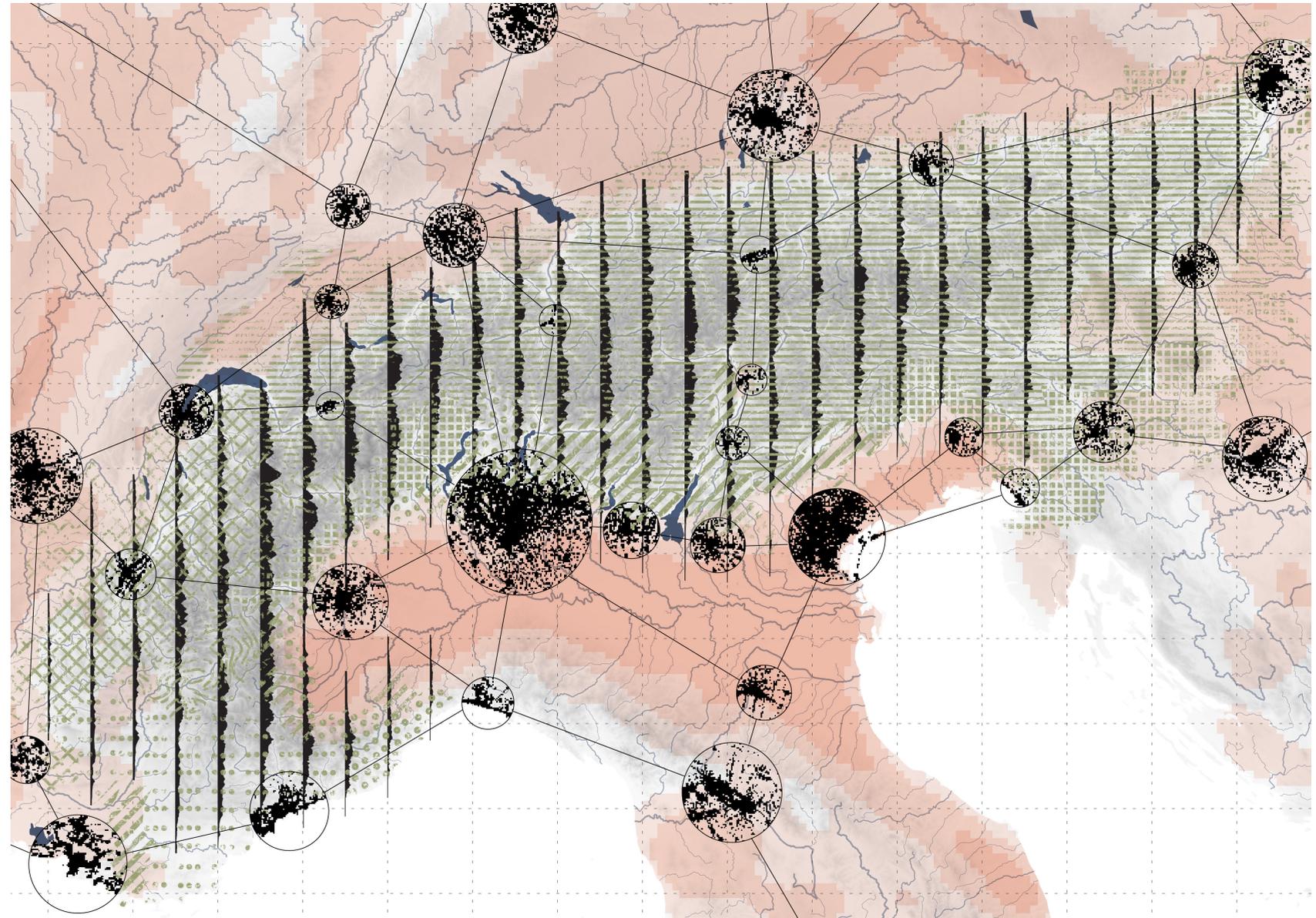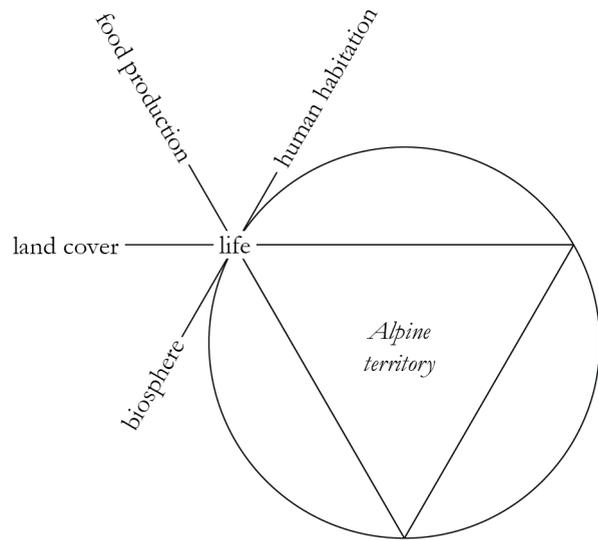
Figure 22. Life | Composition. Main ecological regiona, agriculture, and urban cores.

Woodlands
intensive agriculture
urban cores

1:4.500.000 ———————— 100km

Life: Alterations

Agriculture in the Alps has changed fundamentally since 1945, especially in the last 50 years. A drastic decrease in the number of farms – alone between 1980 and 2000 41% of all Alpine farms disappeared (Tappeiner et al., 2006). Farmland is consolidated and more mechanized modes of farming implemented. Traditional pasture farming allows for a structure-rich landscape with ecological niches for species to thrive, because of mechanization these structures are being removed (Klaus et al., 2021, p. 38). Alongside the proliferation of fertilizers, the change to mowing and meadow agriculture has a large impact on biodiversity (Pornaro et al., 2021).
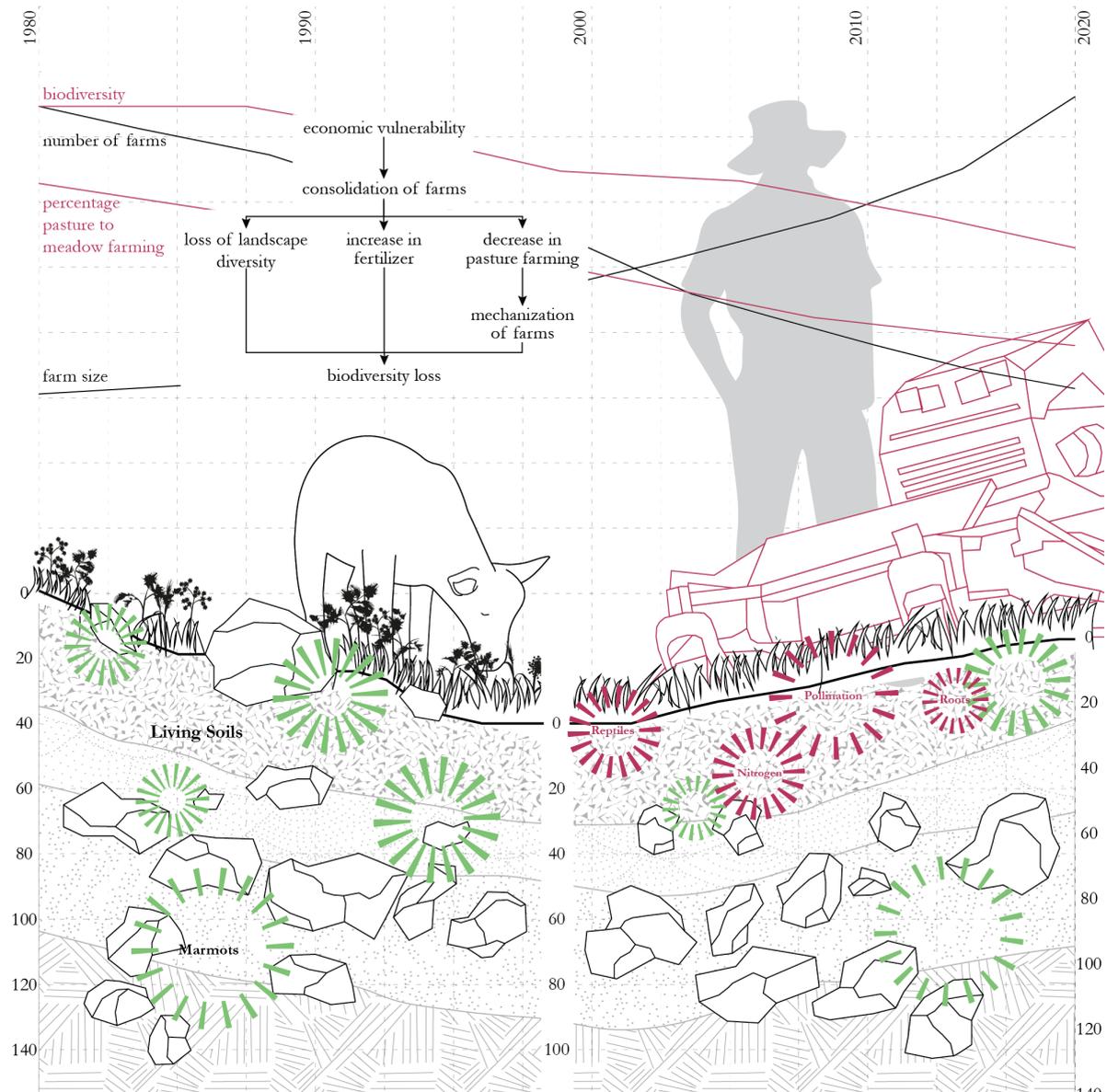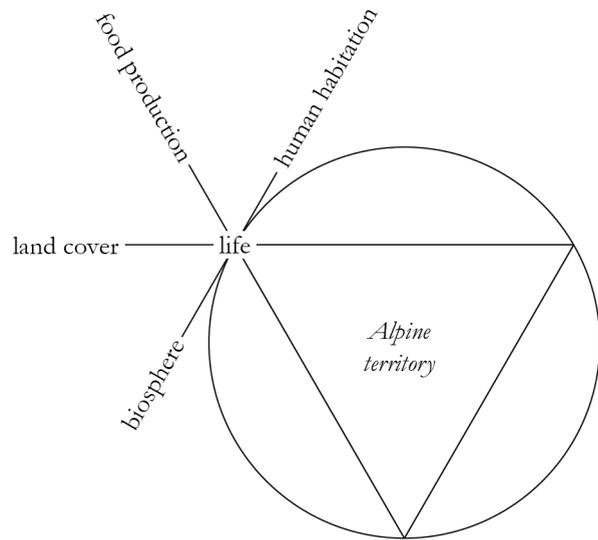

Figure 23. Life | Alteration: The consolidation of farms leads to increase in farming intensity and loss of diversity on pastures and meadows, and their soils. Based on (Casale & Bocchiola, 2022; Flury et al., 2013; Körner, 2021).

Life: Limits

In Switzerland, a third of all known species is vulnerable, endangered, or under threat of extinction (Klaus et al., 2021). Many species are endemic to the Alps and need specific bio-climatic conditions. The presence and survival of these species are embedded within territorial regimes, revealing how biodiversity itself is shaped by logics of land-use and control.
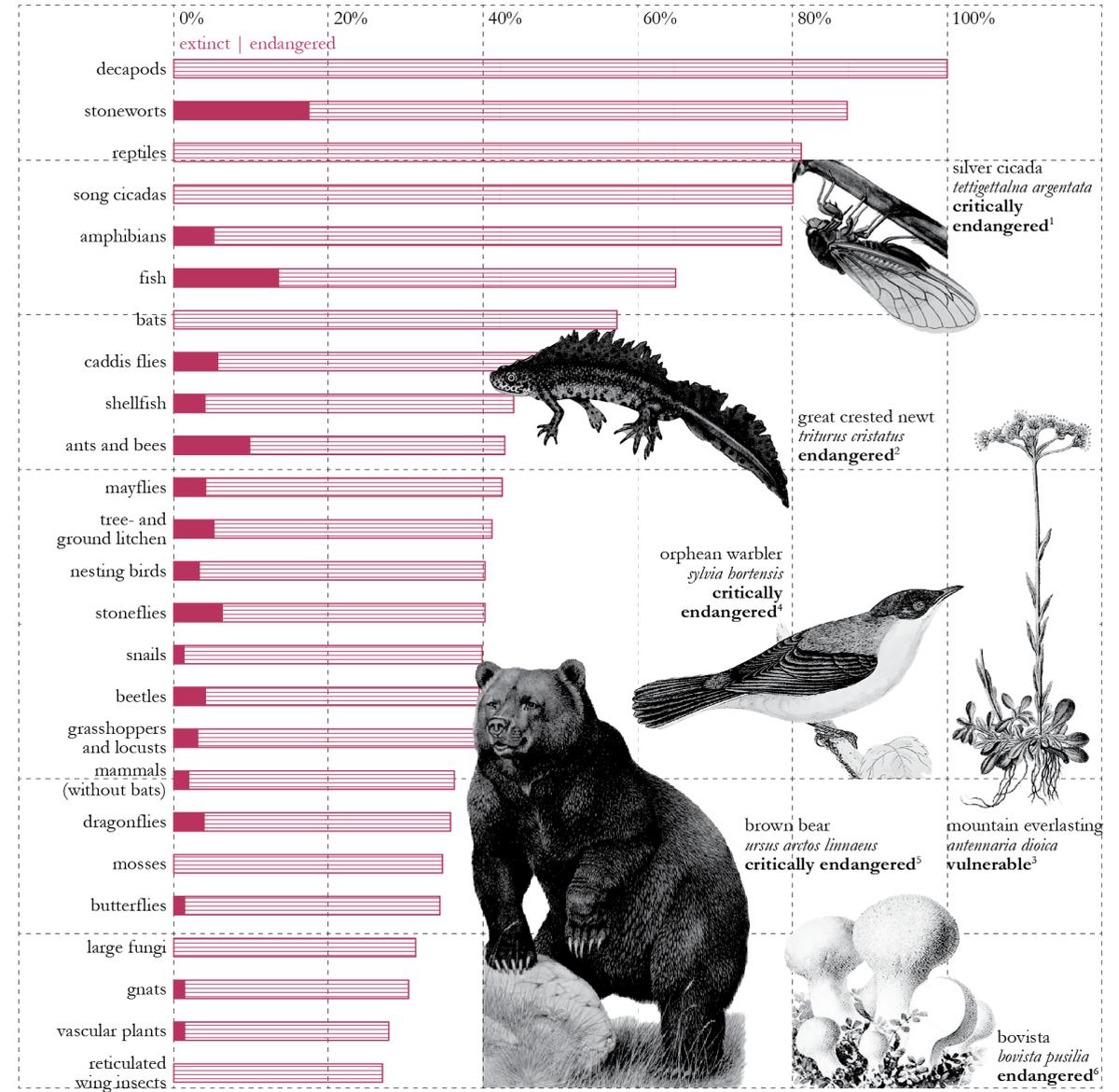

Figure 24. Life | Limit: Endangered and extinct species in Switzerland. From a total of over 10,000 species analyzed, 35% of species are vulnerable or endangered, some categories hit harder than others. Six species of vulnerable and endangered species are depicted.

Adapted from (Klaus et al., 2021, p. 16), additional information from (Capt, 2022; Hertach, 2021; Knaus et al., 2021; Moser et al., 2002; B. R. Schmid et al., 2023; Senn-Irlet et al., 2007)
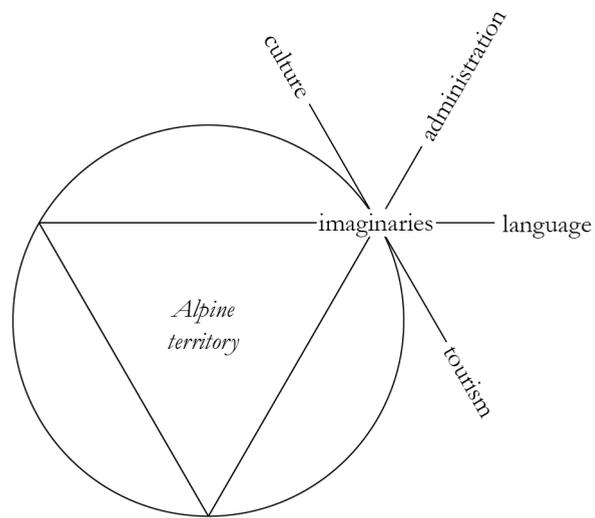
Imaginaries: Composition

The diverse topography leads to microcosms of endemic cultures and languages. The Alps as a borderland is a refuge for traditions and ways of life. The obtrusive geography of the mountains leads to blank areas in the collective imaginaries of nation states, which become "Alpine fallow lands" (Diener et al., 2005), canvasses of projections of national myths, desires, and opportunities. Imaginaries function as instruments of territorialization, enabling the abstraction of mountains into economic assets. The touristic landscape hides the deeper realities of depopulation and decline. Few fallow lands are actively involved in their own futuring, local autonomy is found in Switzerland and parts of Italy.
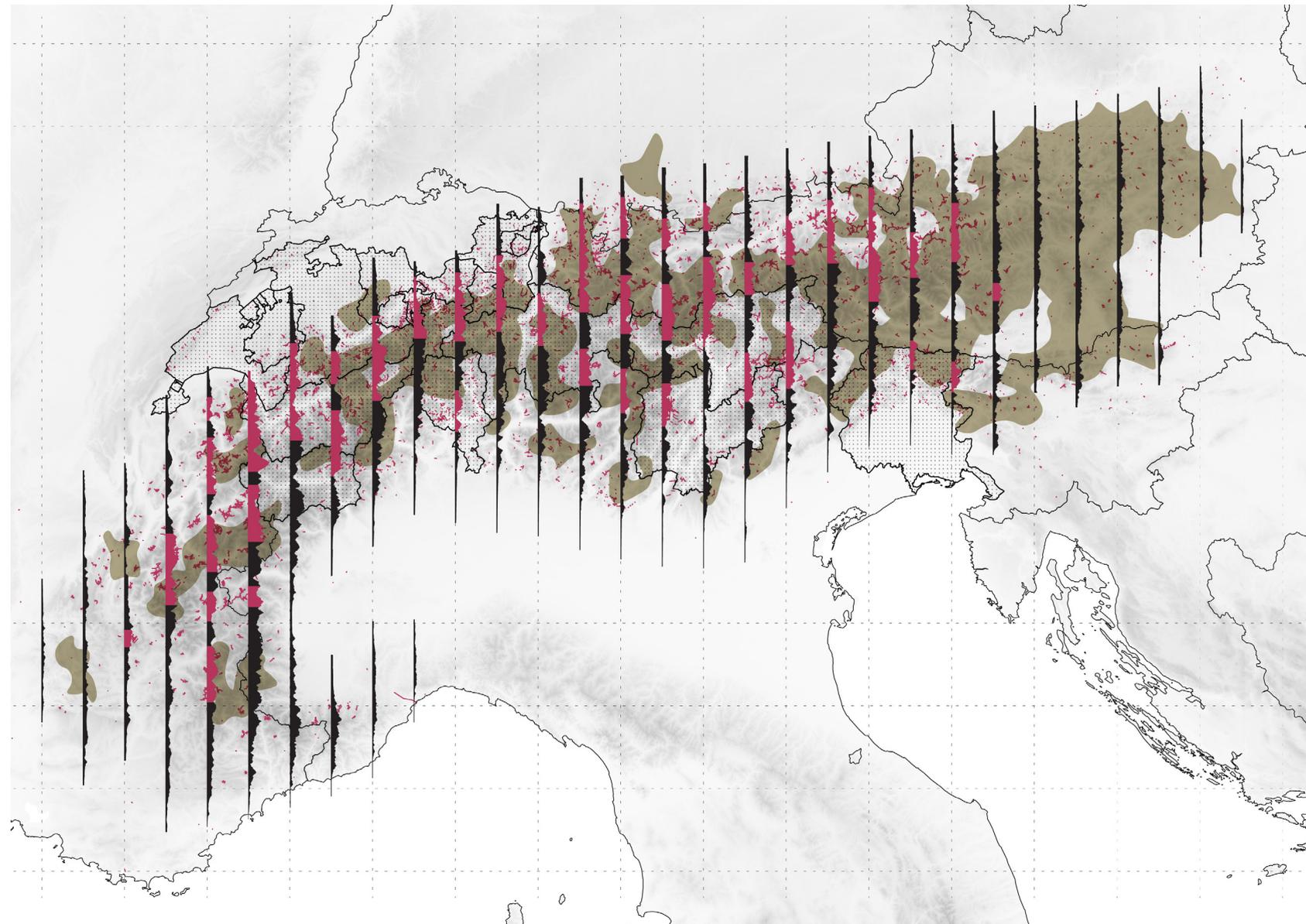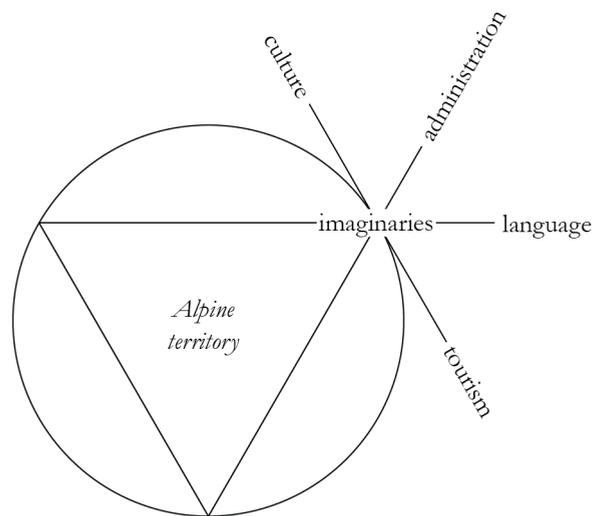
Figure 25. Imaginaries | Composition. Alpine touristic zones and skiing infrastructures, depopulation, regional autonomy.

- touristic zones
- skilifts
- depopulation
- regional autonomy

1:4.500.000 ———— 100km

Imaginaries: Alterations

Development priorities shape the landscape: With the technologies of zoning and investment, touristic infrastructures are expanded, while old farm houses and stables are being abandoned. With much of the Alpine landscape in Switzerland zoned for agriculture, the Spatial Planning Act allows "recreational land uses", but not the adaptive re-use of farm buildings (Bundesgesetz Über Die Raumplanung, 2019). The intent to protect agricultural zones has as much to do with preserving food production as it has to do with upholding an image of the open landscape, unobstructed by development. Counterintuitively touristic infrastructures keep expanding into the open landscape.

ecological balance. They shall be kept largely undeveloped, according to their various functions. Agricultural zones shall include land which:
a. is suitable for agricultural horticultural use and is required to fulfil the various agricultural tasks or
b. should be used for agricultural purposes in the general interest.
2 Wherever possible, agricultural zones shall be demarcated as large and continuous areas.
3 The cantons shall take appropriate account of the various functions of the agricultural zones in their planning activities.
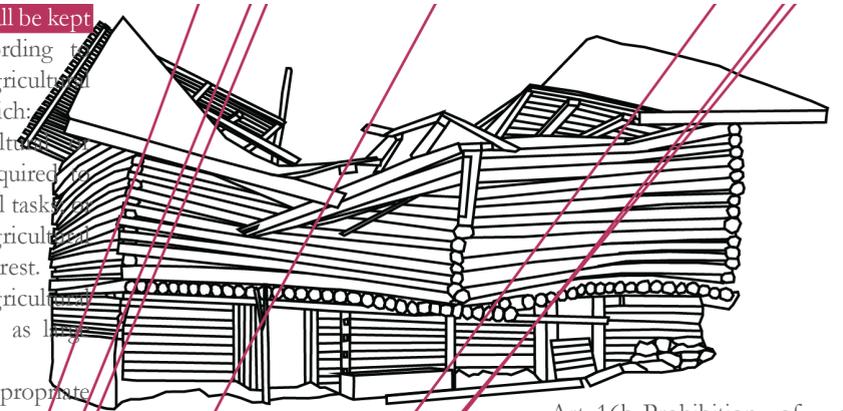
Art. 16b Prohibition of use and removal
1 Buildings and installations that are no longer used for purposes conforming to zone requirements and for which usage in terms of Articles 24–24e is not permitted may no longer be used. This prohibition shall cease to apply as soon as they can again be used in conformity with zone requirements.
2 If authorisation is granted for a limited period or subject to a condition subsequent, the buildings and installations must be removed when authorisation ceases to apply, and the location must be restored to its previous state.
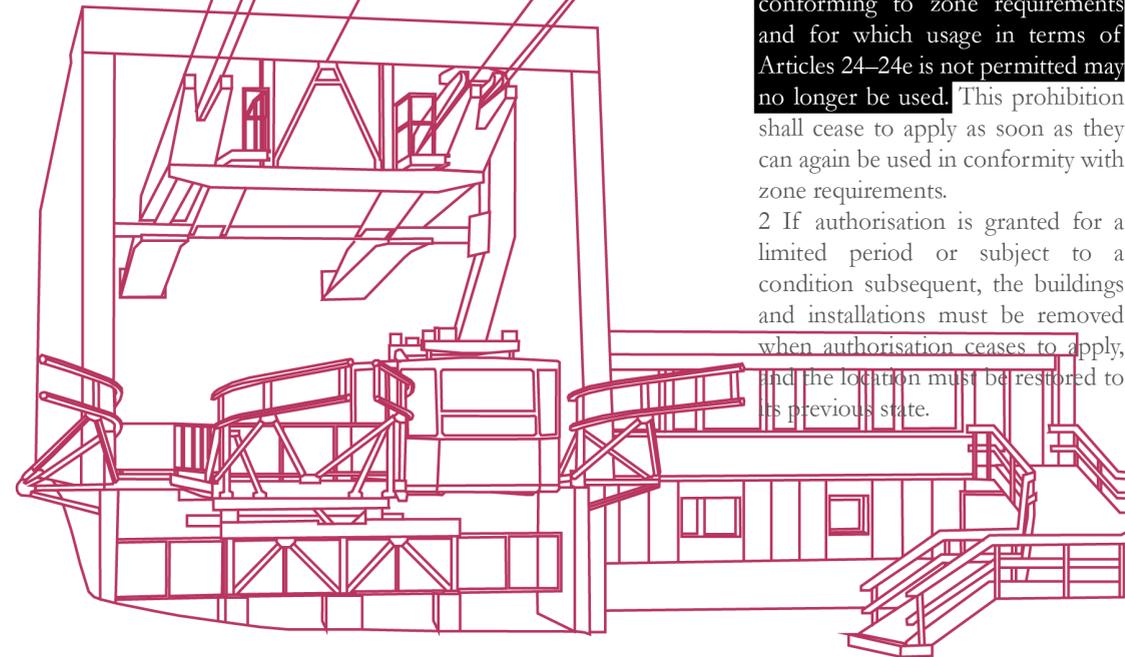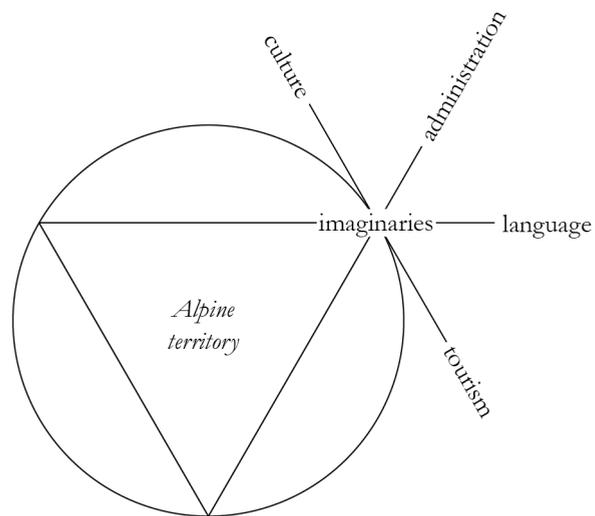
Figure 26. Imaginaries | Alteration: Abandoned stable and cable car, with Articles 16 and 16b regulating land uses in agricultural zones from the Swiss Spatial Planning Act superimposed.
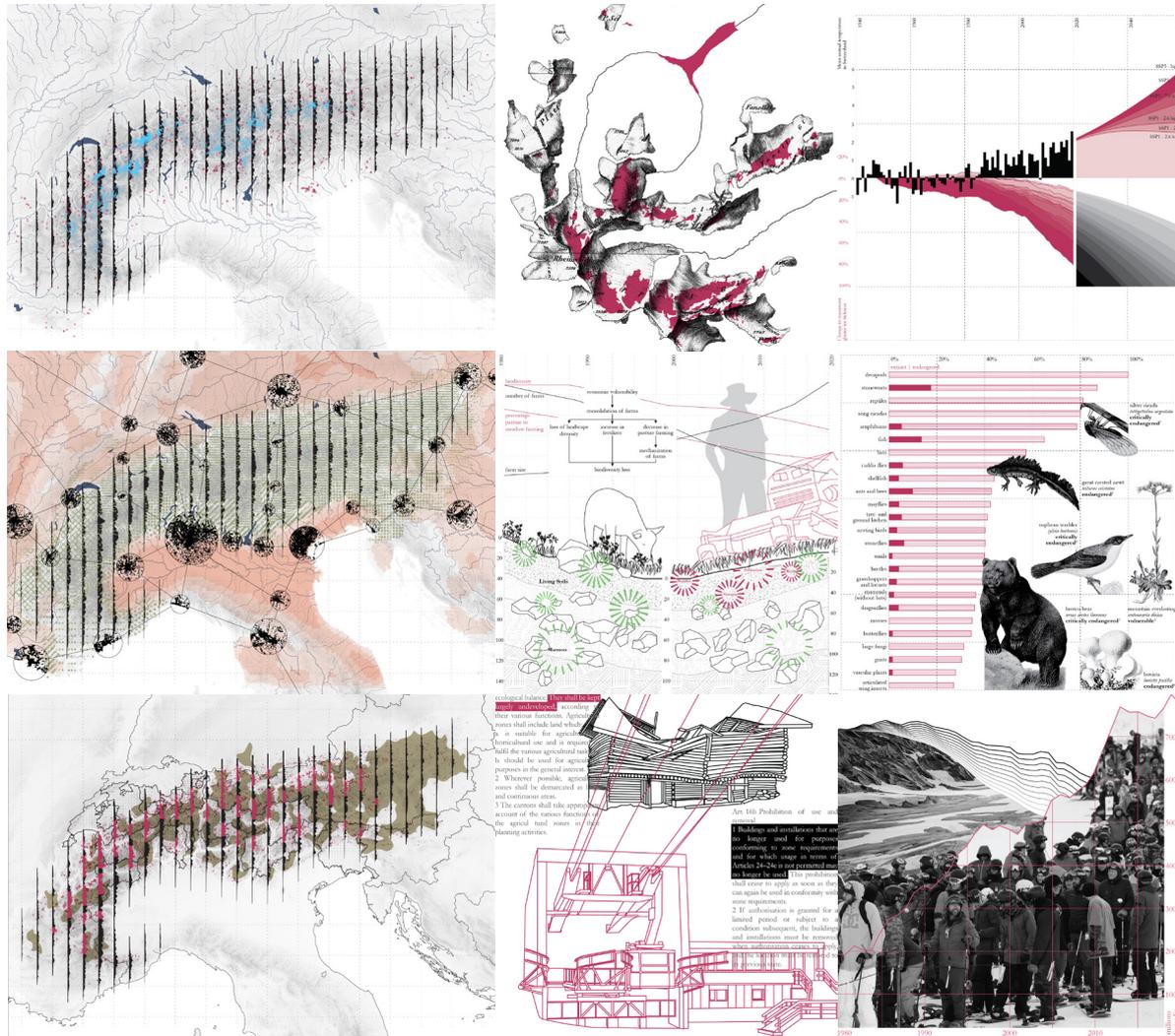
Imaginaries: Limits

The tourist economy of the Alps has grown rapidly in the last 50 years – an eight-fold revenue increase in Switzerland since 1975 (Bundesamt für Statistik, 2022). At the same time snow availability is decreasing, pushing ski tourism areas to invest into snow-making infrastructure. The white band of snow in the green landscape doesn't seriously impact the imaginary of winter tourism (Pütz et al., 2011), but it has serious impacts on water availability (Knowles et al., 2024; Pütz et al., 2011) and ecosystems (Rixen et al., 2003). Rising temperatures are pushing the ski tourism landscape to higher altitudes, also with adverse impacts on biodiversity (Elsasser & Messerli, 2001). Alpine imaginaries are increasingly shaped by the volatility of water: as a vanishing aesthetic (snowy slopes), economic resource (snow making) or a looming threat (economic decline).

Figure 27. Imaginaries | Limits: Rapid growth of the touristic economy, contrasting with the reguction in snow cover. based on (Bundesamt für Statistik, 2022)

Reflections

Having examined the Alpine territory through the intertwined dimensions of Land, Life, and Imaginaries, each analysed through composition, alteration, and limits, let us now turn to reflect on the systemic patterns and processes that emerge when these layers are held against one another. Specifically, three themes and a central actor emerge: they are deterritorialization, defuturing, and extended urbanization, as well as the agency of water.

Deterritorialization

If territory is produced through the projection of power, labour, and meaning, Claude Raffestin sees deterritorialization as the erosion of those relationships – overriding the local systems of territorial production (Raffestin & Butler, 2012). Several interlinked processes contribute to the deterritorialization of the Alps as we know them.

The reassignment of land to touristic purposes and intensive agricultural production, disconnected from local, embedded systems of production, break down the original territorial relations of those inhabiting and working with the land. This is a largely external reconfiguration through the labour of monetary investment, or control mechanisms (market forces, regulation, pollution). The ecological substratum that sustains the territory is eroding, physically undermining the conditions necessary for territorial reproduction. The symbolic and cultural orders that imbued the Alpine landscape with meaning are being displaced – a loss of the semiotic layer of territory. Deterritorialization is not just top-down by outside forces, but bottom-up too: the abandonment of farms, or cultural disconnection to the land.

Defuturing

Processes by which certain actions, systems, or designs undermine the conditions of possible future life – unsustainable, exploitative, extractive logics – are apparent through the analysis; What Tony Fry describes as defuturing: the negation of world futures (Fry, 2020). For Fry, defuturing is designed, ontological, and rooted in modernism and capitalism, particularly in growth-oriented paradigms, linear time conceptualizations, and technoscientific dominance.

The replacing of valuing sustainment with economic value, such as can be seen directly through intensified agriculture, or indirectly through the growth of tourism, sacrifices futures for present gain – or even just economic survival for farmers in an exploitative economic system. Economically, defuturing is very blunt: the disappearance of glaciers, the deformation of the cryosphere, the extinction of species, literally and finally ends futures. Defuturing emerges from designed systems: zoning laws, infrastructure, tourism economies, agricultural markets. It is a systemic effect embedded in how the territory is (re)imagined, planned and consumed.

Extended Urbanization

The theory of extended Urbanization, articulated by Neil Brenner (2014) as planetary urbanization, and densified by Christian Schmid, is first and foremost an invitation "to look at what is seemingly outside of the urban and to study processes of urbanisation "beyond the city" that are transforming sparsely settled areas."(C. Schmid & Topalovic, 2023, p. 25). The Alps as a sparsely settled area exhibits many processes of urbanization. The operationalization of the Alpine hinterland for core urban systems of extraction and consumption is in sum the force that is driving deterritorialization and defuturing form a top-down perspective. Schmid describes extended urbanization as an interplay of three processes: the material production of urban space, the production of territorial regulations, and the production of urban experiences in everyday life (C. Schmid & Topalovic, 2023, p. 44).

Infrastructures like hydropower dams (Land Composition, Alteration) and tourism (Imaginaries Limits) reconfigure the Alpine landscape to support urban functions, contributing to the material production of urban space. Traditional ways of living are supplanted by urban-aligned routines (Life Alteration). The imprint of territorial regulations is all over the Alpine territory (Land Limits, Life Alteration, Imaginaries Alteration). It becomes clear that the Alpine territory is in a process of urbanization, which is creating new functions, rearticulating existing ones, and undermining others.

Water: (another) Territorial Actor

The anthropogenic alteration of the Alpine territory is irrefutable. But apart from us, there are others whose agencies have historically far surpassed ours, and who will not be marginalized easily. An important actor across the territory is water. Today, water remains central to the physical geography, ecological dynamics, cultural, and socio-economic systems.

Across all dimensions of the analytical framework, the agency of water is noticeable. But despite its formative role of the Alpine territory, water has been underrepresented in the cultural narrative and planning paradigms. It has been treated as a resource to be harnessed and thus often stripped of its agency, through damming and snow-making infrastructure, and folded into extractive logics. However, water has become a disruptive actor: destabilizing the cryosphere and thus socio-ecological and economic systems. Its altered state contributes to the deterritorialization effort in the Alps, through glacial retreat and breakdown of the material and symbolic foundations of the Alps. It accelerates defuturing as species cease to exist because of the altered hydrosphere, and water-dependent tourism economies struggle. And it is an attractor of urbanization processes like the development of power stations.

Yet this same agency also positions water as a potential partner in rethinking Alpine futures. To refuture the Alps not just to mitigate climate change effects, by to rebuild territorial relations on a new foundation – recognizing water as a co-constructive actor of the territory. This means designing humbly by respecting the seasonal variability, ecological constraints and functions, flows as generative forces, and presence of water as a value. A reterritorialization grounded in water would shift from domination to cohabitation, from control to adaptation. It would realign spatial planning and design with hydrological systems, support forms of agriculture and land use that follow rather than resist water's cycles, and restore cultural imaginaries that include—not exclude—water's complexity and power.

Problem Statement

The Alps are undergoing profound transformations across ecological, social, and spatial dimensions. These changes manifest across three interrelated layers of territory: as material artifact, as relational network, and as a designed construct. Together, they illuminate the overlapping crisis of climate change, biodiversity loss, and the erosion of agency of local human and non-human actors under the anthropocentric paradigm of modern capitalism.

Territory as material artifact

The Alps are materially destabilizing under the pressures of the climate crisis. Glacial retreat, altered hydrological regimes, and shifting seasonal thresholds are reshaping the physical basis of the territory. This degradation undermines water security, ecological resilience, and the viability of land-based practices. The erosion of ecological and infrastructural conditions necessary for sustaining life across temporal horizons defuture the Alpine territory.

Territory as relational network

Concurrently, the relational structures that historically constituted the Alps as territory—rooted in more-than-human coexistence, situated local knowledge, and embedded practices of care—are being dismantled. Extended urbanization, market-driven land use, and the dissolution of traditional agriculture are disembedding Alpine communities from their environments. This deterritorialization also reflects a condition of defuturing, where cultural and ecological continuity is sacrificed in favour of efficiency, mobility, and speculative growth.

Territory as design practice

These material and relational ruptures are not incidental—they are produced and reproduced through design. Infrastructures, spatial policies, and dominant imaginaries converge to impose a linear, extractive temporality onto the Alpine territory. This design logic privileges short-term optimization and legibility over long-term sustainment, directly causing defuturing by closing down plural, place-sensitive futures. The continued marginalization of more-than-human actors within this framework reinforces the disconnection between territorial systems and the conditions that support life.

However, within this destabilization lies the possibility for refuturing—a reorientation of design practice that shifts from control to cohabitation, from efficiency to care. Central to this reorientation is water: not only as a medium of change, but as a co-constitutive actor capable of reassembling material, social, and symbolic relations. Designing with water opens a pathway toward reterritorialization—Alpine futures grounded in ecological interdependence and reciprocity, territorial plurality, and shared adaptation across human and more-than-human communities.

Research Question

How can more-than-human communities in the Alps reclaim their agency under changing climatic and hydrological regimes through embracing water in the culture landscape to take an active role in their own refuturing, illustrated by the case study of the Lumnezia Valley, Switzerland?

SQ1)
How can the Nature-human divide be bridged toward realizing distributed agencies among more-than-human communities?

SQ2)
What are the plain and hidden processes of (de)futuring and (de)territorialization of the Alpine territory and the Lumnezia valley?

SQ3)
Which actors and processes co-construct the water culture landscape?

SQ4)
How can urbanists and designers set a framework for pluriversal autonomous design toward sustainment in the Alps?

Answering these questions will be the focus of the rest of this thesis. Chapter 2, *Conceptualizations*, aims to approach SQ1, through a literature review, theoretical mapping, and the conceptual framework. Part II, Chapters 3 *Hidden in Plain Sight* and 4 *Actors & Processes* aim at answering SQ2 and SQ3, through a forensic version of the layer approach to spatial analysis, as well as a systematic review across scales and seasons of the processes and actors involved in the water culture landscape. Finally, Part III, Chapter 5 *The Water Garden* and Chapter 6 *Refuturing*, employ a research-by-design approach to find speculative answers to SQ4, and the main research question.

Chapter 2

Conceptualization

The theoretical and conceptual frameworks in this chapter derive their basic construction from my philosophical stance based in critical realism and research by design. Deliberately departing from the cartesian school of research based in empiricism and objectivity of "conventional western research", in this thesis I explore an anti-positivist stance. Critical realism means the understanding that "there is no one external reality, only different ways of knowing that reality" (Peake et al., 2025, p. 178), and is commonly held in feminist, queer, and decolonial research, stemming from a relational world view: "Beings don't pre-exist their relatings" (Haraway, 2003, p. 6).

The guiding methodology in this thesis is research by design, which finds roots from the Dutch approach of *ontwerpend onderzoek*, literally translating to research by design, meaning the production of knowledge through creative-explorative futuring. "In this way, previously unthought-of connections and unconventional approaches can be shown, which also provoke and thus start new debates on content", as prof. Marianne Gatti (2024) states in an essay on the revision of the spatial concept of Switzerland, which is currently being reworked and in consultation (as of May 2025). She points out that research by design is missing in the Swiss planning framework, which is largely based on institutional collaboration, not on a broader debate of creative ideas from all sectors of society (Gatti, 2024). She notably demands more involvement of private companies, I would add the inclusion of civil society groups, and private persons.

Going further, prof. Daniela K. Rosner proposes design fabulations, to reclaim and rewrite the practice of design from a feminist perspective, providing one alternative framework of design not based on a universalist claim (Rosner, 2018). Reclaiming the practice of design for her means understanding and re-interpreting the past and present of design practice (Rosner, 2018, p. 15). Autonomous design acknowledges that anyone is a designer of their own lifeworld (Escobar, 2018b) which provides a challenge and limitation to the format of a monography such as this thesis.

Figure 28. Snowpack at Vella, Lumnezia

Figure 29. Theoretial mapping of designs
for the water culture landscape.
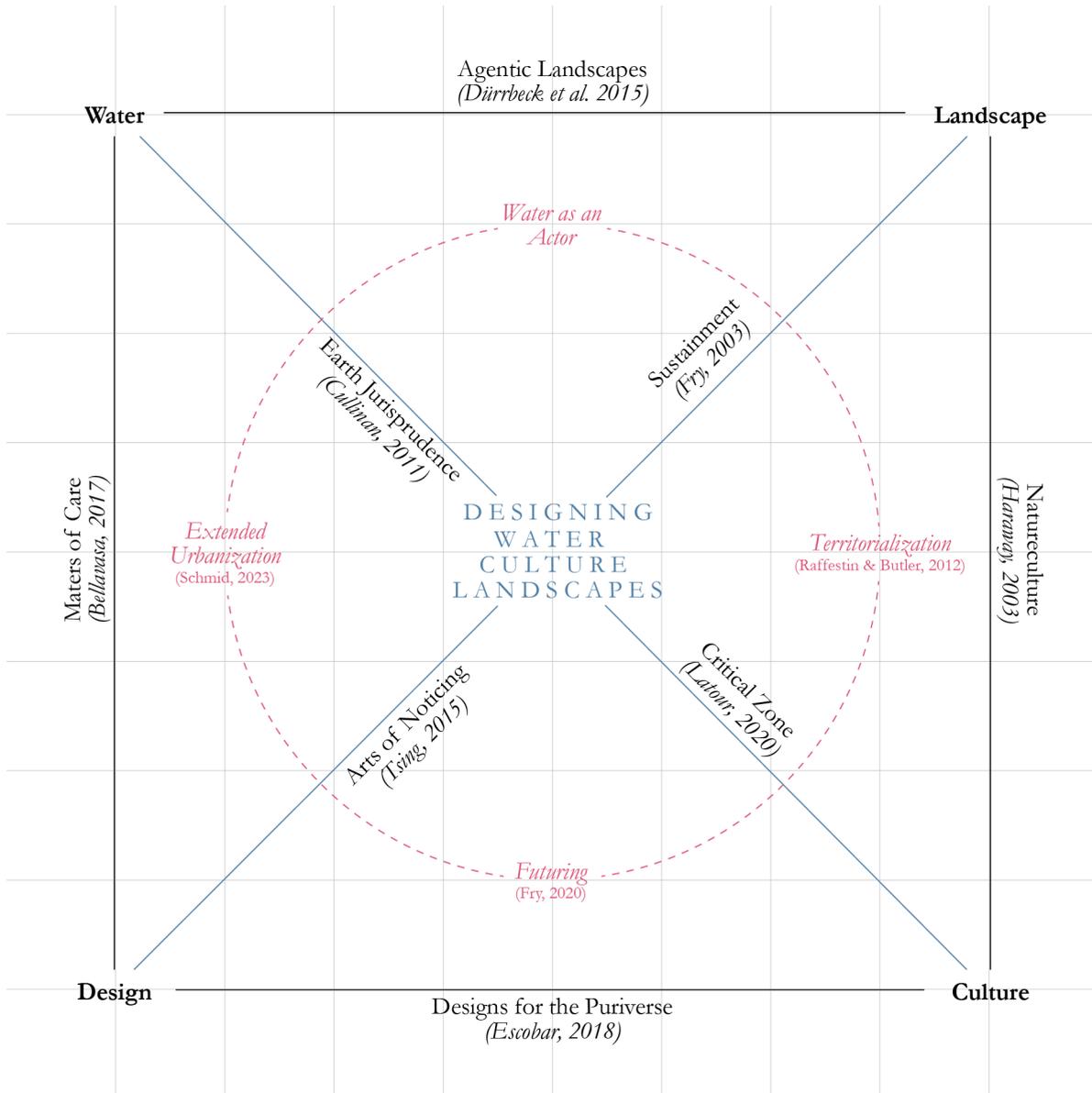
Theoretical Mapping

The theory relevant for this thesis locates itself spanning between the poles of design, culture, landscape, and water. In addition to the concepts directly related to one another in Figure 29 there are many concepts relevant to this work. I will explore a number of them on the following pages.

On Spatial Justice

Territorialization and extended urbanization raise the question of spatial justice – understanding that justice has "a consequential geography" (Soja, 2013, p. 1). In this thesis I am particularly interested in the aspect of procedural spatial justice as described by Roberto Rocco (2023): finding (in) justice in the negotiation, planning, and design of space by different actors. Rocco emphasises the importance of "silent stakeholders", with whom he specifically means the Planet and future generations, thus hinting at a sense of more-than-human agency in the concept (Rocco, 2023).

On Futuring

Futuring is inevitably a political process and rooted in ontological discussions on time. As I already discussed in the introduction and chapter 1 under meta-themes and the problem statement, there is a clash between different understandings of time, everyday time versus capital time by Rillig (2014), for instance. Taking procedural justice into account, the "right to the future" becomes important, not just to decide on aspects of a "brighter" future, but in conceptualizing "future" in general. Who is allowed to make this decision is just as important as how this decision can be made.

Design for autonomy might initially be perceived as an oxymoron, as Arturo Escobar points out (Escobar, 2018a, 2018b), he then sets out a deceptively simple and convincing explanation: autonomous design means "that every community practices the design of itself." (Escobar, 2018a, p. 143). He also connects design for autonomy as a realignment of design towards an autonomous futuring of communities.
There is a historic argument supporting this: In pre-modern times, but also deep into the 19th and 20th century in Europe, particularly in areas in the margins of centralized (designing) powers, communities were actually independent, or interdependent. One such margin, for a long time, were

the Alps, a territory which came into being as a political project of unclear boundaries first and only later was operationalized by the agencies of political and economic power (Ferrari et al., 2019).

A limitation of appropriating "autonomous design" as a framework is how Escobar ties it into traditional forms of communal thinking and understandings of traditions, as well as alternative futures like "buen vivir", which are Latin- American in origin (Escobar 2018). Transposing a concept from one geography to another requires a careful translation and negotiation.

A possible tie-in to a Swiss framework of design for autonomy is the Subsidiaritätsprinzip, the "subsidiarity principle". One of the three pillars of Swiss spatial planning, the Subsidiaritätsprinzip aims at locating governmental responsibilities at the lowest possible level – i.e. at the government level closest to local issues, in accordance with a federalist understanding of nation state organization (Grêt-Regamey, 2020, p. 63), in other words: Local issues should stay local, national issues should be shared between all levels of government. I see autonomous design as an evolution of this Subsidiaritätsprinzip applicable on politics and agency much more broadly.

On Pluriversal Design

In an influential book for this thesis, Designs for the Pluriverse, Escobar also writes about the pluriverse as the making of worlds, again embracing the idea of autonomous design, connecting it with ontological design, and shaping the real world as a multiplicity of different realities – or life worlds (Escobar, 2018b; John & Akama, 2021). Going beyond just perspectives, Pluriversal design must be seen as "a set of beliefs, values, and systems of knowledge that articulates communities' social life to religion, politics, the economy and the environment" (Cadaval Narezo et al., 2023, p. 1146). Thinking in a Pluriverse gives a framework to dissonant realities which cannot – or should not – be integrated into a single framework for design – universal design.

To work with this understanding of a "world, in which many worlds fit" (Escobar, 2018b, p. xvi), Eveline van Zeeland's (2024) literature analysis of 103 papers synthesises two foundational prerequisites - "1) nurturing diversity and 2) embracing interconnectedness" (Van Zeeland, 2024, p. 6),

and seven design principles, which are as follows:

> Cultivating radical empathy, Fostering (re)imagination and delinking, Encouraging physical encounters, Employing narratives,Utilizing mapping, visual thinking, and bodily expressions, Embracing a participatory approach, Harnessing knowledge.
> (Van Zeeland, 2024, pp. 7–11)

For me as a designer, it is useful to have design principles, but at the same time the idea of Pluriverse also cautions against following a set rulebook, crossing off boxes on a checklist goes against the idea of thinking in many worlds. Van Zeeland acknowledges though: "I have chosen to articulate design principles because they allow for choice, permitting diversification in practice depending on the specific context." (Van Zeeland, 2024, p. 12)

On Rights of Nature

Earth jurisprudence describes an Earth-centered approach of organizing human societies (Cullinan, 2011), recognizing the relational nature of human evolution and survival and thus obligating human systems of governance to preserve and care for the entire "earth community" (Cullinan, 2011). Humanity and everything we do is part of this community, along with every other species, the ecosystems, the climate system, water and carbon cycles, and energy from earths core and the sun. Earth Jurisprudence aims to shift our perspective from a human-centric to an ecocentric relationship with Nature (see also Bonnedahl & Heikkurinen, 2018; Kujala et al., 2019; Neumayer, 2012).

There are multiple ways of operationalizing Earth jurisprudence: be them legal personhood, rights of Nature, or indigenous legal frameworks. By January 2025 the Eco Jurisprudence Monitor documents 543 initiatives to grant some sort of legal rights to Nature, 53 of which are in Europe, four initiatives in Switzerland (Kauffmann, n.d.).]
There is no precedent for the granting of legal personhood or other rights to Nature in Switzerland. The Swiss constitution states the confederation " is committed to the long term preservation of natural resources" (Art. 2). In European Law, anthropocentric and instrumental views prevail (Alves et

al., 2023). A parliamentary initiative to include rights of Nature in the Swiss federal constitution was submitted in 2021 (A. Schmid, n.d.).

Another approach to connect Natureculture and policy together could be the notion of the Parliament of Things. Conceptualized by Latour (2018, 2005, 1993), it is a way to give voice to things in the sense of representation and participation in policy and decision-making. The Parliament of Things is a hybrid forum, envisioned as a body where human actors such as scientists, politicians, citizens and advocates collaborate, but which crucially also allows things to speak for themselves. This involves listening to them, but it can also mean the construction of new things – quasi-objects, to allow humans to converse with non-humans (Simons, 2017, p. 15). The embassy of the North Sea is an ongoing project which aims to construct such a parliament, by learning how to listen to the North Sea, then to enter into conversation, and finally to negotiate with the other stakeholders (Middeldorp, 2018) . The concept of the Parliament of the Alps by Emily Stecher (2023, p. 210) as part of her Master thesis in Urbanism at TU Delft also lays a foundation in a similar context as my thesis. The parliament of things doesn not have to be a concrete organization or framework. It can also be a metaphor for how decisiond should be reached and actions performed toward a relational world.

"Things" has a special meaning: here they are understood as actants, not passive objects. Actants, in contrast, actively influence others and are influenced by others, within actor networks – An active mediator rather than an intermediary, in an anti-reductionist sense (Krarup & Blok, 2011; Latour, 2005). Things can also be assemblages of other things, blurring boundaries between humans and non-humans, natural and artificial, subject and object (Haraway, 2016, 1991) At the same time it is important to note that things don't have to be necessarily Nature-cultural hybrid, as Natural and social order don't always have to be linked (Harbers, 1995; Latour, 1993).

On Natureculture

On the topic of blurring boundaries, Natureculture specifically bridges the gap between humans and the rest of Nature, through understanding the deep entanglement of human life within Nature, emphasizing the interfaces between the two. Hybrids are things that show Natureculture at work, they are created through the collective effort of actors. This can take the form of companion species or cyborgs like Haraway writes about (Haraway, 2016, 2003), but agricultural landscapes are hybrids too: co-created through the effort of the farmer, microorganisms, plants, animals, groundwater, the weather system, policies of land management, et cetera.

On Matters of Care

Care, as thoughts of in Matters of Care by Maria Puig de la Bellacasa (2017), is an epistemic view upon hybrids: Care is a practice to maintain and repair worlds, and it is an ethics of attentiveness to the vulnerabilities of others. It is also a material practices involving labour, politics, and affections (De La Bellacasa, 2017, p. 5). Joan Tronto defines care as "a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, our selves, and our environment, all of which we seek to interweave in a complex, life-sustaining web." (Tronto, 1991). It is not inherently reciprocal, but the cared-for entities certainly influence the caregiver, thus making acts of care a process of distributed agency. De la Bellacasa also consciously expands the boundaries of care to non-humans, as they are also a part of the worlds of sustainment, she gives the example of the permaculture movement which centres around acts of care for the soil and environment, which in turn provides acts of care for humans (De La Bellacasa, 2017).

On Gaia and Agentic Landscapes

The term agentic landscapes is taken from Gabrielle Dürbeck, Caroline Schaumann, and Heather Sullivan (2015), a trio of scholars of modern languages and literature, who analysed the notion of agency in a broad sense, under the paradigm of new materialism, of Nature in writing of notable European writers, academics, and travellers from the romanticist period (starting around 1700) to modernism. In those days, a travel account from Leslie Stephens, early glaciological reports from David Forbes, or novels by Goethe were the mass media, shaping the imagination of the Alps in readers throughout Europe and the western world. Those writers noted the dynamisms of environmental processes such as weather, water, geology and

so forth to have their own inner workings, energy economies, and external impacts. Concluding their literature analysis, Dürbeck et al. state:

> "The act of scraping away the very illusions of control and power that allow us to function day to day, as Goethe, Forbes, Stephen, Döblin, and Duve do so adroitly when portraying their various visions of distributed agency, reshapes our human sense of agency during the Anthropocene and places it into a larger framework of weather, landscape, and other material circumstances. This contextualization provides a grounded sense of the Anthropocene that moves away from the simplified Promethean notion and opens up our actions into a spectrum of agencies."
> (Dürbeck et al., 2015, p. 133)

Dürbeck et al. see a particular expression of distributed agency in the description of disasters, where the human agency is suddenly confronted with the non-human agency of "chemical, physical, and technological forces", which together form "hybrid, post-human agencies on a vast scale" (Dürbeck et al., 2015, pp. 128–129).

The Gaia hypothesis is intimately connected to the notion of distributed agency. "Gaia is the Name of [the] Cascade of Entangled Metabolisms" (Lenton & Dutreuil, 2020, p. 175) in a human, more-than-human, and bio-physical sense: the conditions of Life on Earth are not just sustained by physical processes, but by Life itself. Connecting this to Matters of Care and the active maintenance of worlds, Gaia blurs the line between epistemology and ontology – As the Cascade of entangled Metabolism is also the "total ensemble of living beings" (Lovelock, 1979). Gaia also possesses agency of their own, distributed over all of Life that makes Gaia.
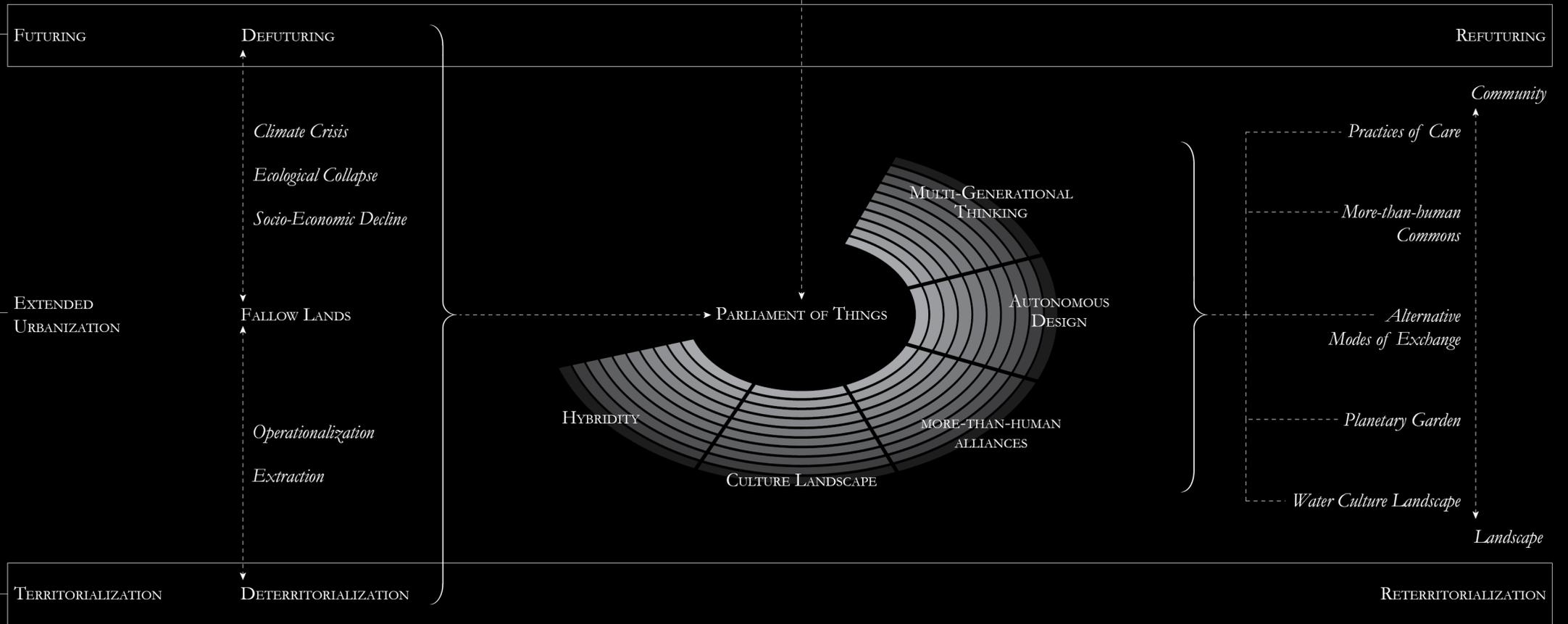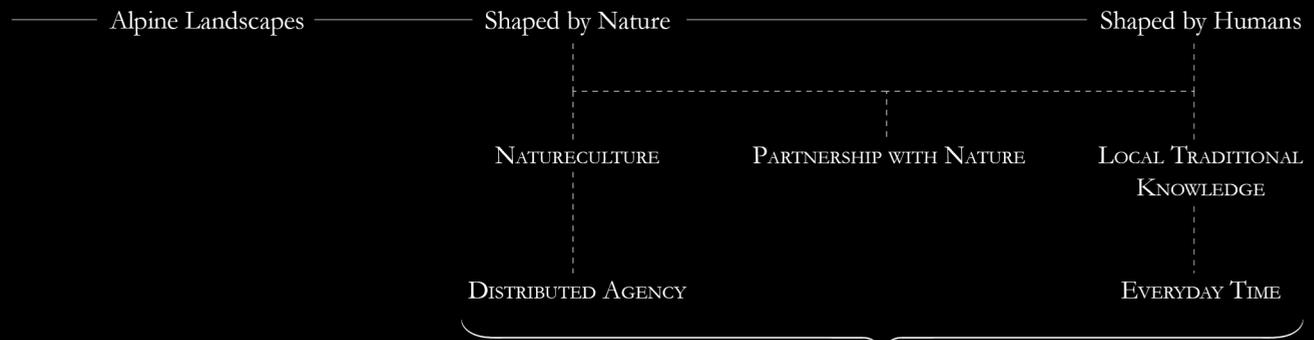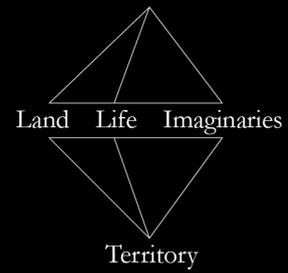
From Resource to Partner

Human-Nature relationships exist on a spectrum. For people working in the landscape, this is a highly complex question. Farmers in particular earn their livelihood through this relationship, and thus have well-developed (entrenched) views upon this topic. The local specificities play a key role in interventions into the landscape.
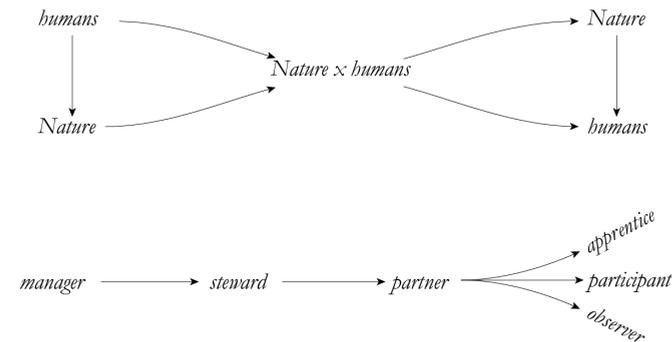
Swiss mountain agriculture has a long tradition of stewardship toward Nature. The Allmende (Commons) and Alpkorporation (Cooperative Pasture Farms) are two legal frameworks codifying and operationalizing the stewardship model. While both are primarily about regulating access and usage rights of common goods, their multigenerational philosophy carries an innate care for and sustaining of Natural Resources. Going a step further, Chapman and Deplazes-Zemp in a study on nature-human relationships of Swiss mountain farmers identify the tiered gradient of humans' roles in Nature, and show that many actually see themselves as in partnership with, or as apprentices to Nature (Chapman & and Deplazes-Zemp, 2024, p. 10):

> "My motto is simply, that what grows you take . . . So you look if you have too little food you just have to sell some animals in the fall. Every year I look how much feed I have for how many animals and then so many animals are kept. And then you go to the butcher or not. Yes then nature decides how it really is on the farm. […] Nature is the boss. She is the one who determines how much there is and I don't have more."
> *interviewee, from (Chapman & and Deplazes-Zemp, 2024, p. 10)*

Figure 30. Gradient of Nature-human relationships and power structures, identifies in a study on Swiss mountain farmers. Adapted from (Chapman & and Deplazes-Zemp, 2024, p. 7)

Land   Life   Imaginaries

Territory

Alpine Landscapes — Shaped by Nature — Shaped by Humans

NATURECULTURE   PARTNERSHIP WITH NATURE   LOCAL TRADITIONAL KNOWLEDGE

DISTRIBUTED AGENCY   EVERYDAY TIME

FUTURING   DEFUTURING   REFUTURING

Community

Practices of Care

Climate Crisis

Ecological Collapse

Socio-Economic Decline

MULTI-GENERATIONAL THINKING

More-than-human Commons

EXTENDED URBANIZATION

FALLOW LANDS

PARLIAMENT OF THINGS

AUTONOMOUS DESIGN

Alternative Modes of Exchange

Operationalization

Extraction

HYBRIDITY

MORE-THAN-HUMAN ALLIANCES

Planetary Garden

CULTURE LANDSCAPE

Water Culture Landscape

Landscape

TERRITORIALIZATION   DETERRITORIALIZATION   RETERRITORIALIZATION

Conceptual Framework

Based on the Territorial analysis of the Alps in chapter 1 the three interrelated processes of Futuring, Extended Urbanization, and Territorialization emerged, as main acting forces on the territory of the Alps and the Lumnezia valley. The Concept of Natureculture serves as speculative ethics: each of the processes can be framed through Natureculture as desirable or not. Reterritorialization and Refuturing are the desired outcomes in this project.

The initial approach is one of recognitional justice: the Parliament of Things. In this project it is not understood as a formal framework by itself, rather it's ethics find their way in the way nature-human relationships are reconceptualized. Hybridity as a concept underpins what the farmers told Chapman and Deplazes-Zemp in their 2024 study. The culture landscape as a set of practices, affections, and ethics/politics incorporates the Parliament of Things in the way the landscape is seen as a co-construction of human and Natural forces over time. Multigenerational thinking as a core ethics of the Alpine space strongly connects with stewardship and partnership.

To recognize the interrelation and co-construction of human and non-human forces, more-than-human alliances need to be formed: Recognizing the strength in interdependency increases agency for all members of such alliances. Seeing Nature as a partner, for example, incentivizes long-term thinking and capacity building, essentially strengthening the resilience of the Alpine space. The increase in agency also finds application in autonomous design, the ability of a more-than-human community to design their own territory and future.

With the parliament of things as a set of ethics and politics, actions can be taken toward refuturing and reterritorialization. Five actions are chosen: strengthening practices of care, more-than-human commons, and alternative modes of exchange focus first on the community aspect of the territory to strengthen the making and maintenance of worlds, with policy and economic frameworks providing regulatory foundations. The water garden and the water culture landscape are concrete interventions in space proposed in this project. They act as a testbed, artifact, and flagship projects which may inspire the transplantation of this framework to different geographies.

Intermezzo

Proposition: Acts for Refuturing

I have established the Alpine territory as an assemblage of Land, Life, and Imaginaries. Using a kaleidoscopic analytical lens, the meta-themes of deterritorialization, defuturing, and extended urbanization emerge as central to the Alps, shaped by extractive capitalist logics. While human control over the territory is evident, water's agency shows the creative force of nonhuman actors in remaking it. I end Chapter 1 with a problem statement: The Alpine territory is being defutured across material and relational layers. Design contributes to this through short-term optimization and simplification, marginalizing other actors and undermining the sustainment of futures. Thus, I formulate the research question:

How can more-than-human communities in the Alps reclaim their agency under changing climatic and hydrological regimes through embracing water in the culture landscape to take an active role in their own refuturing, illustrated by the case study of the Lumnezia Valley, Switzerland?

Chapter 2 begins to address this layered crisis. Bridging the Nature-human divide becomes central to sustaining the Alps as a plural, livable territory. I explore relational ontologies—natureculture, actor-network theory, the parliament of things—revealing the Alps as an agentic landscape. Spatial justice, pluriversal design, and Nature jurisprudence inform design's responsibilities to humans and nonhumans. Design shifts toward autonomous worldmaking: empowering actors to shape their own futures. This ethical pivot is rooted in Matters of Care (Puig de la Bellacasa), positioning design as a political, material, and affective practice—attentive to maintenance, repair, vulnerability, and interdependence. This responds to the first subquestion: How can the Nature-human divide be bridged toward realizing distributed agencies among more-than-human communities? Through care.

Care doesn't require reciprocity, but grows stronger with it. Co-creating futures depends on collaboration within more-than-human communities. Humans remain a powerful force—but we must engage water as another territorial actor. Life depends on it.

Figure 31. Wetlands at Cauma Su,
Lumnezia

Waters for Refuturing

As an outsider, how do I locate myself in relation to the Lumnezia valley? Taking the idea of autonomous design, the designer becomes but a small part of the process of co-creation. To move toward refuturing, the actors and processes must take their own agency. Thus, I see my own agency as a designer in formulating a proposition for one possible future. This has the aim not to solve all problems and provide all the tools and measures for refuturing, but to notice the hidden actors and processes, the agencies of the non-humans, the potentials in space, and visions upon which a discussion may unfold. Only with a picture of an idea can fruitful discussions start. My design aims to create one such picture.

The method for design is the water garden. Part of the planetary garden (Clément, 2015), the water garden is a framework for humans and non-humans to become active together in the practice of creating worlds. The water garden is at the same time one response to the shifts and shocks within the hydrosphere: with the glaciers melting, different forms of water retention in the landscape become more important to support waters' functions in the production of territory. Wetlands play this role - and many others - becoming main characters in our collective more-than-human coping with the anthropogenic climate crisis.

In this thesis I ask myself this hypothetical: What if wetlands gain more importance in the culture landscape of the Alps, and their wellbeing is recognized as part of the collective wellbeing of the human and more-than-human communities in the Alpine space and beyond, dependent on their water for supporing life?

The water garden is also a design exercise, to research by design how distributed agency can work in space and time, across scales. To this end landscapes where certain conditions are present emerge as possible intervention sites. Landscapes where wetlands already exist, where agriculture plays an important role in the production of the culture landscape, where human communities are a part of the landscape in rural spaces, and where there is an existing, but uncertain winter tourism industry exacerbating questions about the future of the Alpine space. Through spatial analysis I found eleven possible sites in the region of interest.
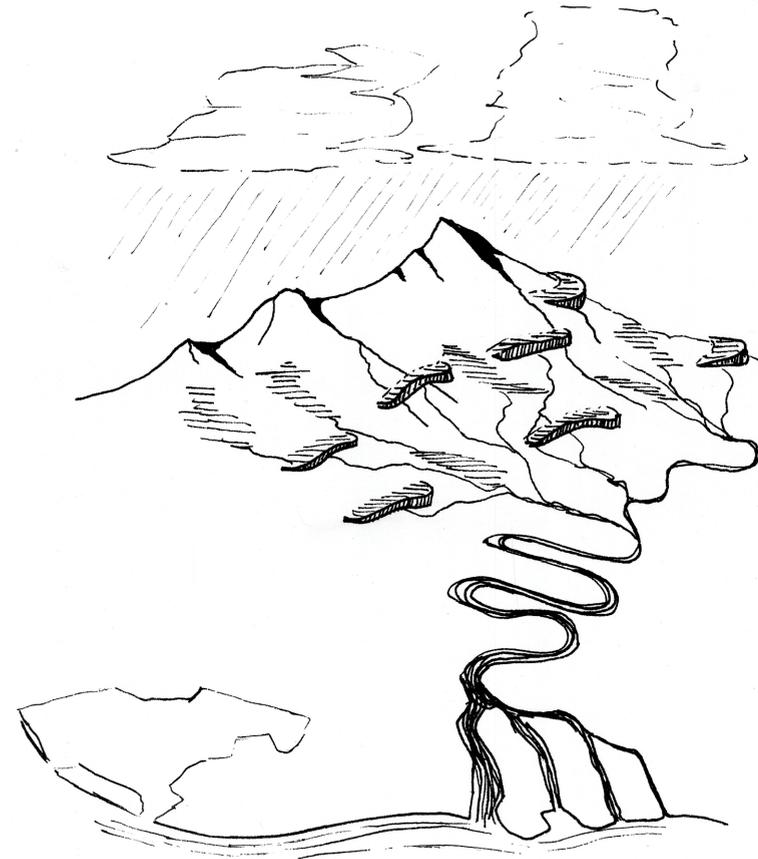
Figure 32. Sketch Waters for Refuturing

Hydrosphere

8km

Figure 33. Land: hydro- and cryosphere

▆	wetlands
───	main rivers
───	streams
▆	lakes
▦	glaciers

Agriculture

8km
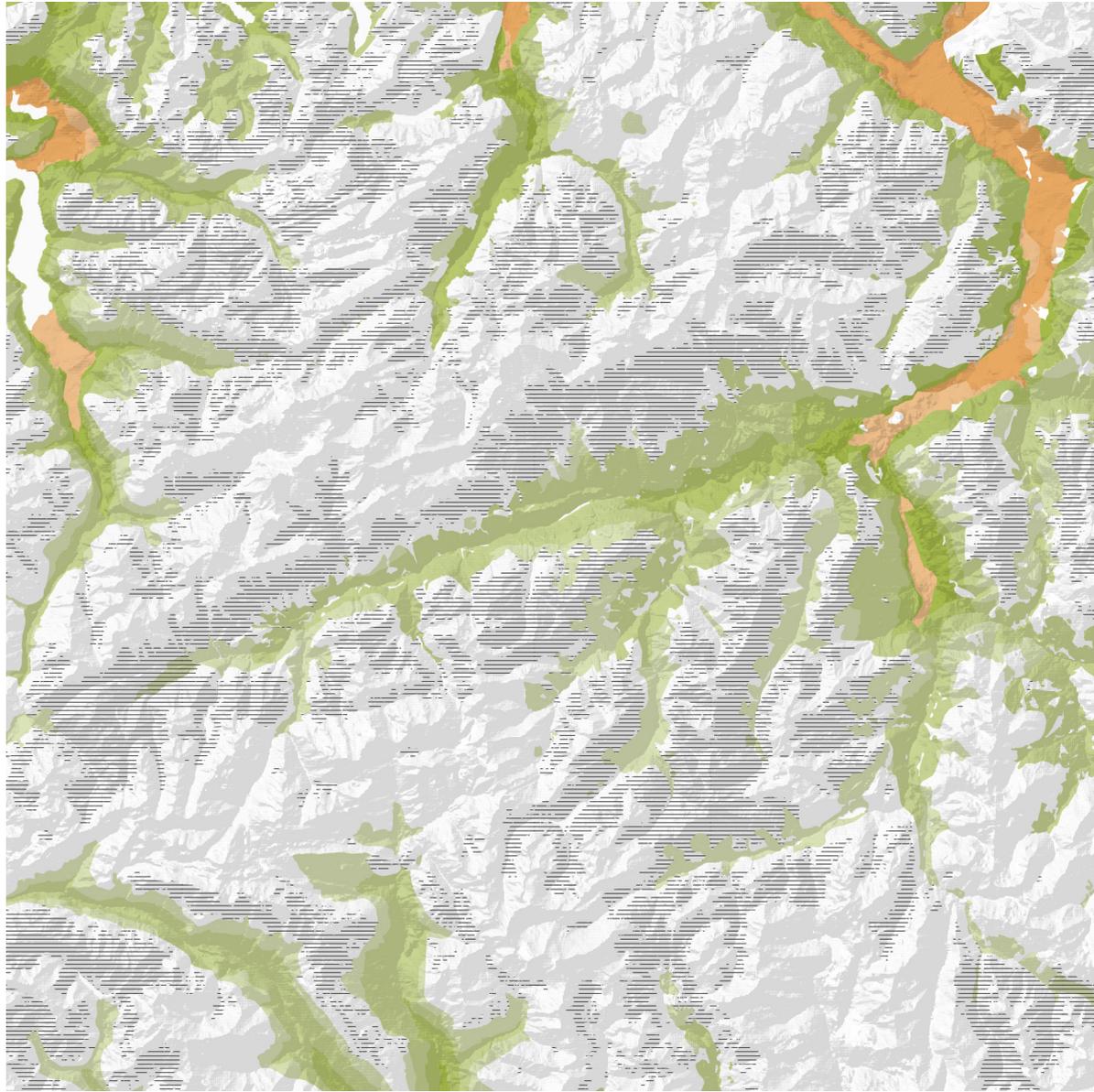
Figure 34. Land-Life: agricultural sphere

▤	summertime pastures
▆	alpine agriculture
▆	lowland agriculture

Habitation & Infrastructure
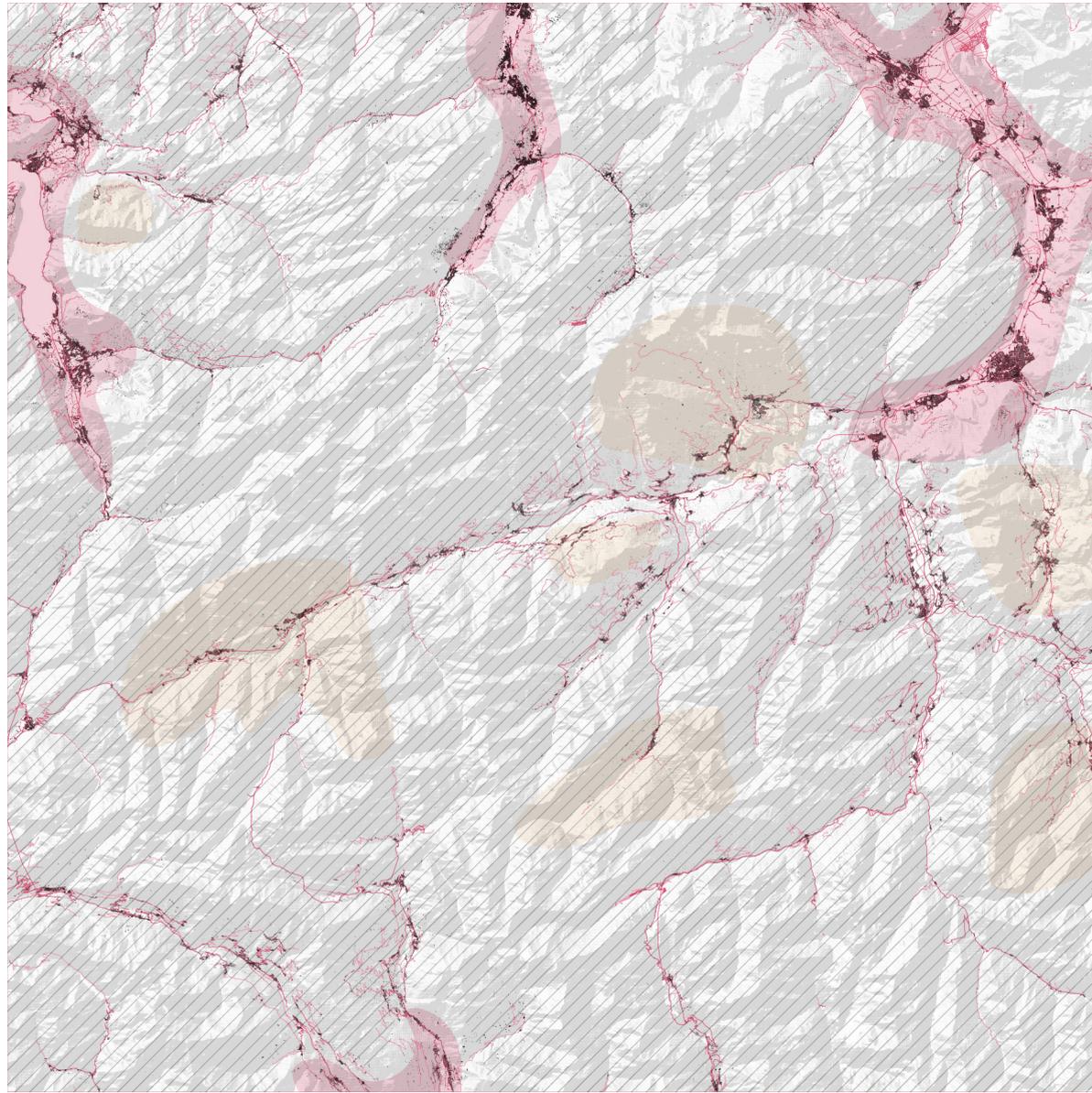
Figure 35. Life-Imaginaries: habitation and infrastructure

landscape types (Diener et al. 2006):

- ▬ built-up area
- ―― main roads
- ―― other roads
- ⧸⧸⧸ Alpine fallow lands
- ▨ City networks
- ▨ Alpine resorts

8km

Winter Tourism
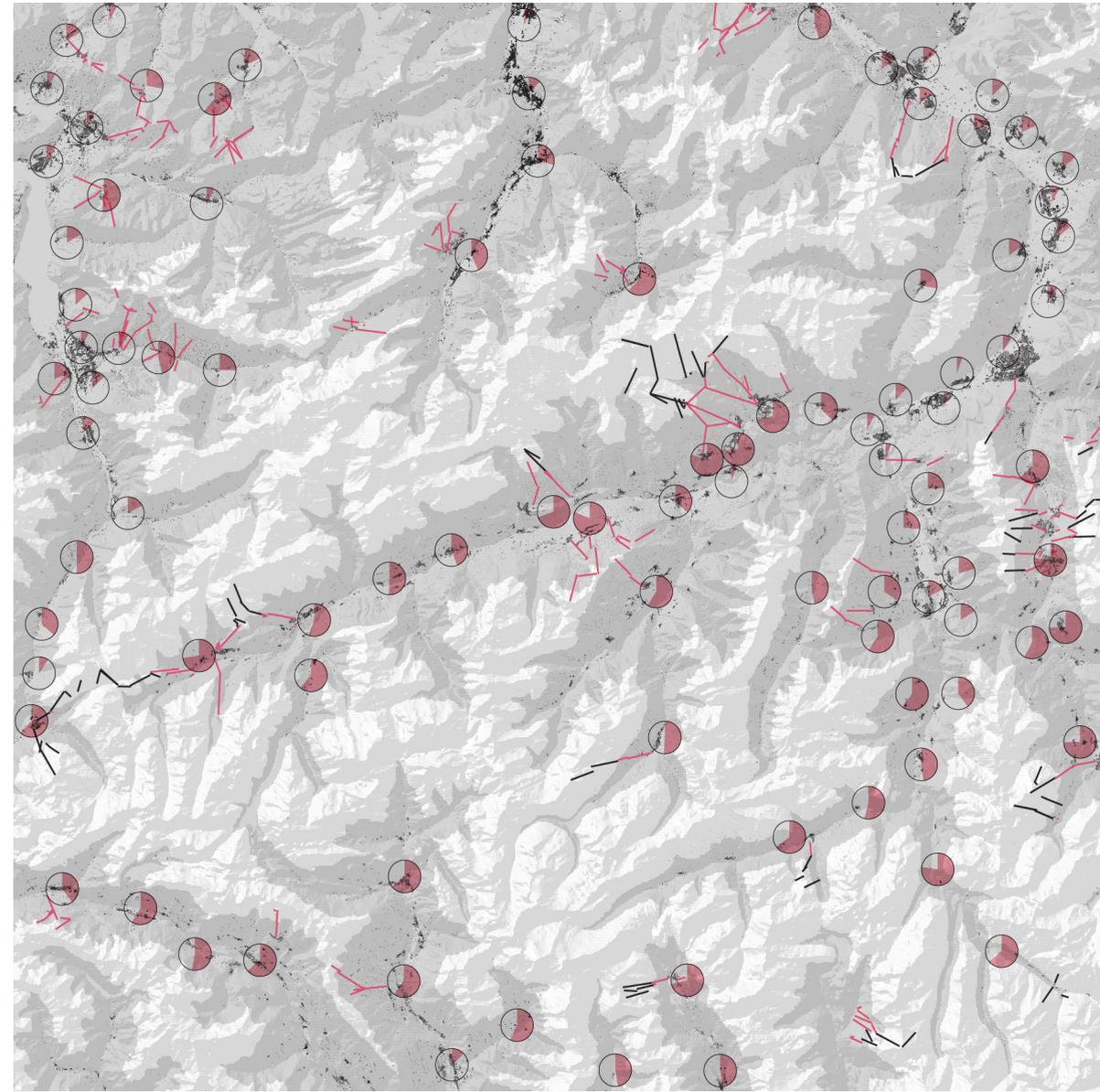
Figure 36. Imaginaries: Tourism

- ▨ snow security (above 2000m)
- ―― snow-safe skilifts
- ―― low lieing skilifts
- ◕ percentage of second homes

8km

Typology of Water Landscapes

Overlaying the layers reveals spatial patterns across the region, with clusters of similar landscape types emerging. At the same time, each cluster presents different combinations and arrangements of landscape types, offering insights to expansions of the design proposal.
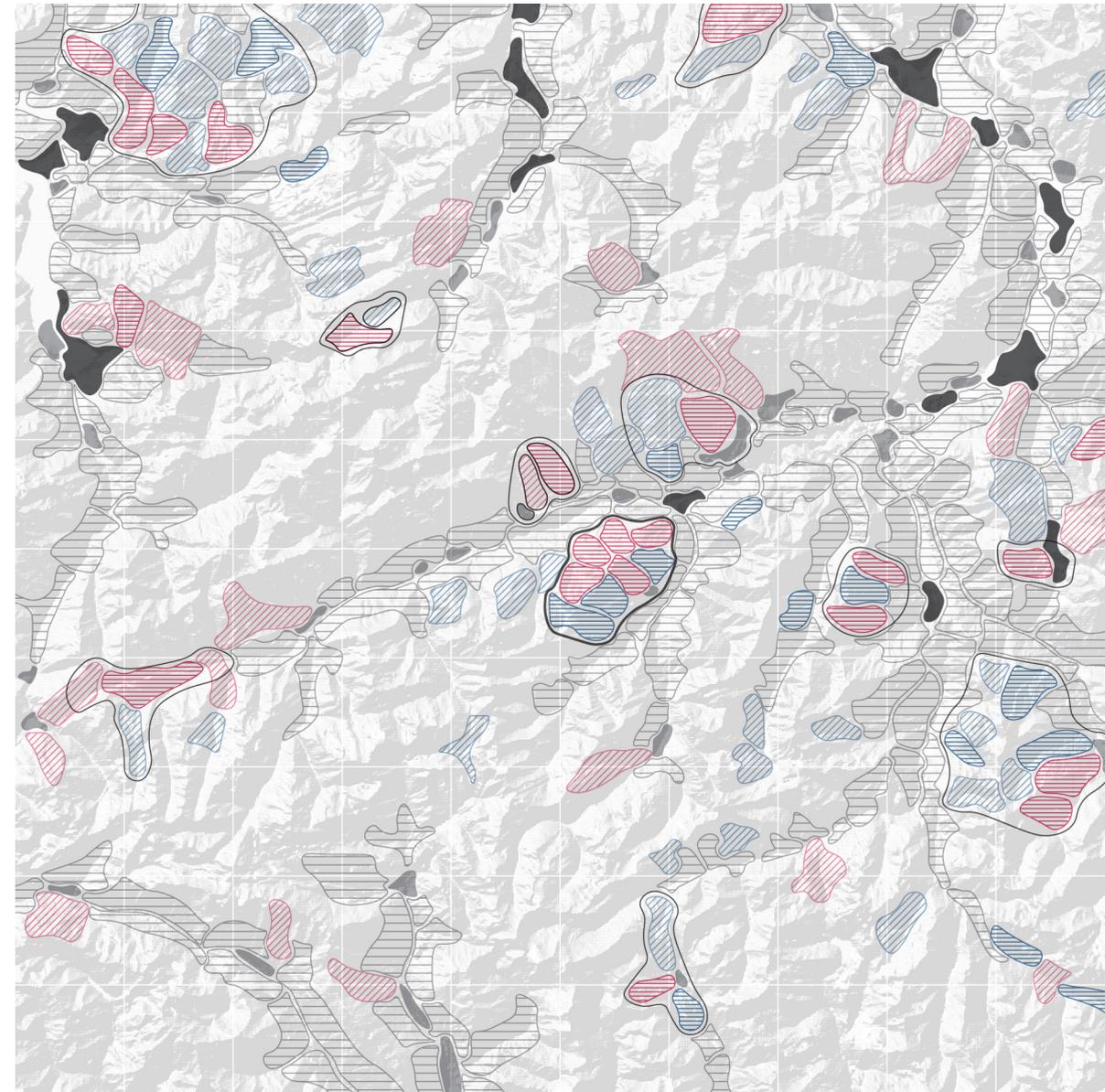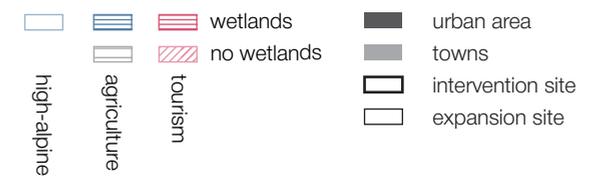

8km

Figure 37. Landscape Typologies

wetlands
no wetlands

high-alpine
agriculture
tourism

urban area
towns
intervention site
expansion site

Intervention and Expansion

from the landscape typology map eleven cluster appear. I grouped them into threee categories, depending on their (physical) scale, the size of the tourism element present, and the classification of Diener et al. (2006) into Alpine resorts or Alpine fallow lands.

The intervention site of the Lumnezia valley and Pez Mundaun mountain is the subject of the design proposal. In a further step this design can be adapted and transplanted to the other sites, for regional effects, networks, and increased water storage in the Alps.
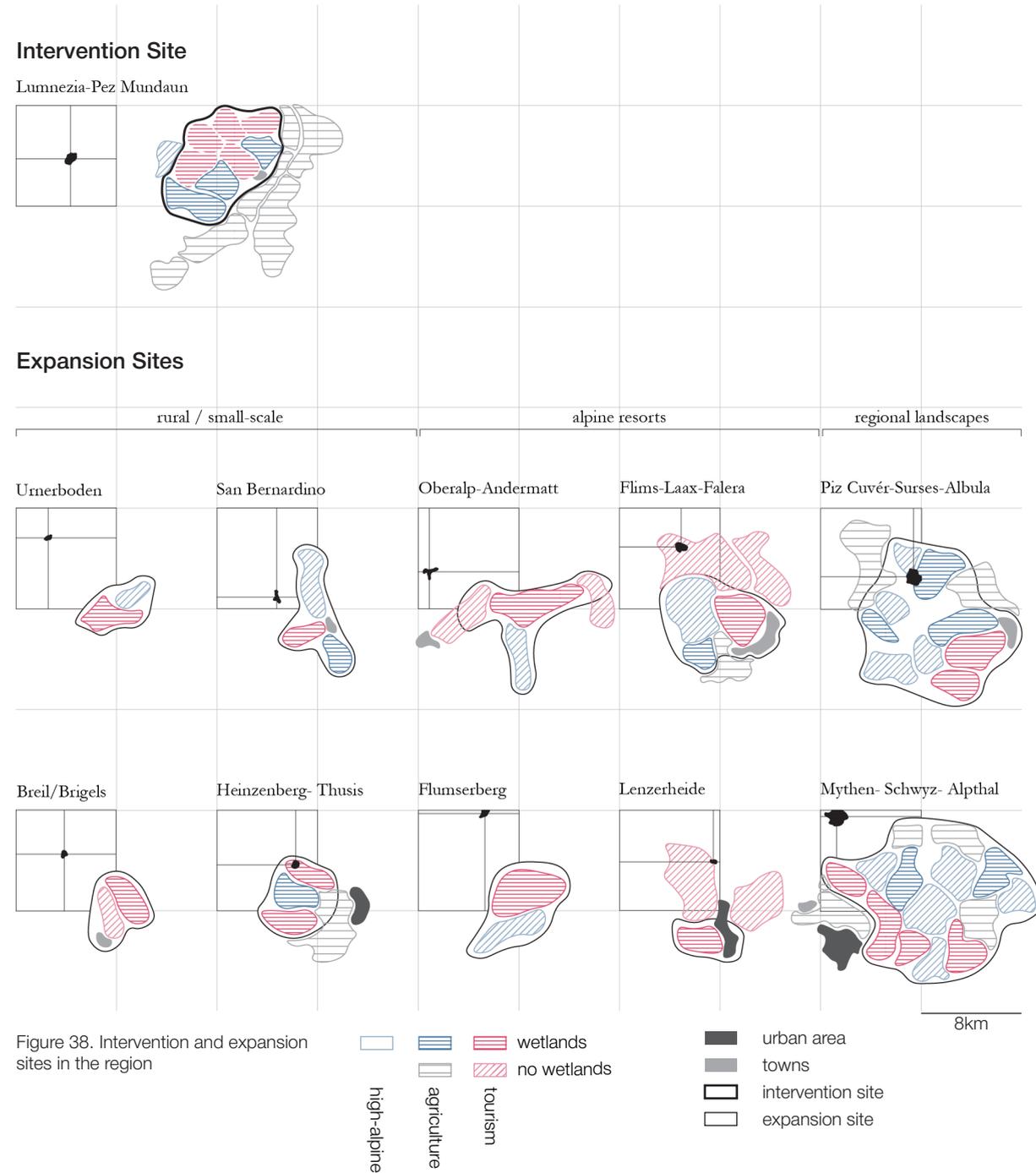
Intervention Site

Lumnezia-Pez Mundaun

Expansion Sites

rural / small-scale   alpine resorts   regional landscapes

Urnerboden   San Bernardino   Oberalp-Andermatt   Flims-Laax-Falera   Piz Cuvér-Surses-Albula

Breil/Brigels   Heinzenberg- Thusis   Flumserberg   Lenzerheide   Mythen- Schwyz- Alpthal

8km

Figure 38. Intervention and expansion sites in the region

wetlands
no wetlands

high-alpine   agriculture   tourism

urban area
towns
intervention site
expansion site

How to continue?

Addressing both the material and relational aspects of territory, I propose the Water Garden—a form of culture landscape, into which the agency of water is embedded. The material aspects of the water garden are multi-scalar, emergent through practices of diverse actors. The relational aspects lie in the framework supporting this emergence: Ontologies of care, more-than-human commons, and alternative modes of exchange. Part III will expand on the water garden and the framework for refuturing.

Apart from the design and proposition of the water garden, it also aims to address the fourth subquestion: How can urbanists and designers set a framework for pluriversal autonomous design toward sustainment in the Alps?

To be able to propose a design, one has to learn from the territory first. Continuing in Part II, (Un)Learning, I will approach the Lumnezia valley as the site of investigation. In the idea of unlearning, the aim is to not let pre-conceived notions of the area as an Alpine fallow land obfuscate the real world. In Chapter 3 I aim to establish the mainline view of the valley, to uncover hidden stories of the landscape, to aim for a diverse mosaic of viewpoints. Chapter 4 deals with the processes, and actors, that co-create the landscape. Concluding the next part, a manifesto lays out the knowledge base, and the design goals and measures that arise from this base.

"We learn […] alternative stories and spatialities only by **unlearning** what we think we knew about landscape. [We] must be attuned to the task of learning how our world is written in all its multiplicities, in ways that both exceed and contradict that which we think we know" *(Friess & and Jazeel, 2017, p. 21)*

(Un)Learning

Part II

Chapter 3

Hidden in Plain Sight

Landscapes and Spaces are frequently interpreted through what is most immediately visible: spatially through an analysis of the main layers of the landscape such as water, infrastructure, and land-use, and historically through a historic overview. These modes of investigation are certainly valid, but much of what shapes the place remains unseen, be it in slow-moving geological forces, ecological margins, cultural practices, or minor conceptualizations of the landscape. This chapter turns to Lumnezia to learn what narratives are contained within it, by deconstructing the traditional layer approach, aiming to uncover how the landscape embodies historical development, collective memory, and environmental transformation.

To gain forensic perspectives on Lumnezia, one has to touch the surface first. A visual and spatial overview and a historic timeline of the area provide the departure point for further investigation. Setting this surface as a departure point, the second part of the chapter dives into four themes of investigation. Each theme is explored through a main history, setting the framing, and a minor story, which explores a peculiarity of the Landscape which, at first glance, might be overlooked. In fact, each minor story is an important base point for the design and refuturing chapters of this thesis. Uncovering minor stories may open up perspectives toward refuturing which have previously been unheard.

The four themes chosen orient themselves – roughly – at the analytical framework. *Geology*, mostly connected to *Land*, explores the deep-time history of the Alps, and how those forces actively shape the landscape to this day. *Water in the Landscape*, which is connected both to *Land* and *Life*, examines hydro-ecological processes that lead to the formation of wetlands, which are often overlooked in the Alpine space. The investigation of *Landscape Maintenance*, which sits between *Life* and *Imaginaries*, aims to deconstruct the dual-narrative of the Alpine space as pristine nature or production site, and narrates the deeper cultural roots of traditional agricultural and landscape-care practices, to show how landscapes are actively shaped through care. Finally, *Names and Places,* mostly connected to *Imaginaries* and *Land*, explores the deeper meaning of names in the Landscape not just as a tool for orientation, but also placemaking and artifact of history and culture, as well as the loss of names – and thus places – through land consolidation.

Figure 39. Cow paths forming ridges
above Vella, Lumnezia
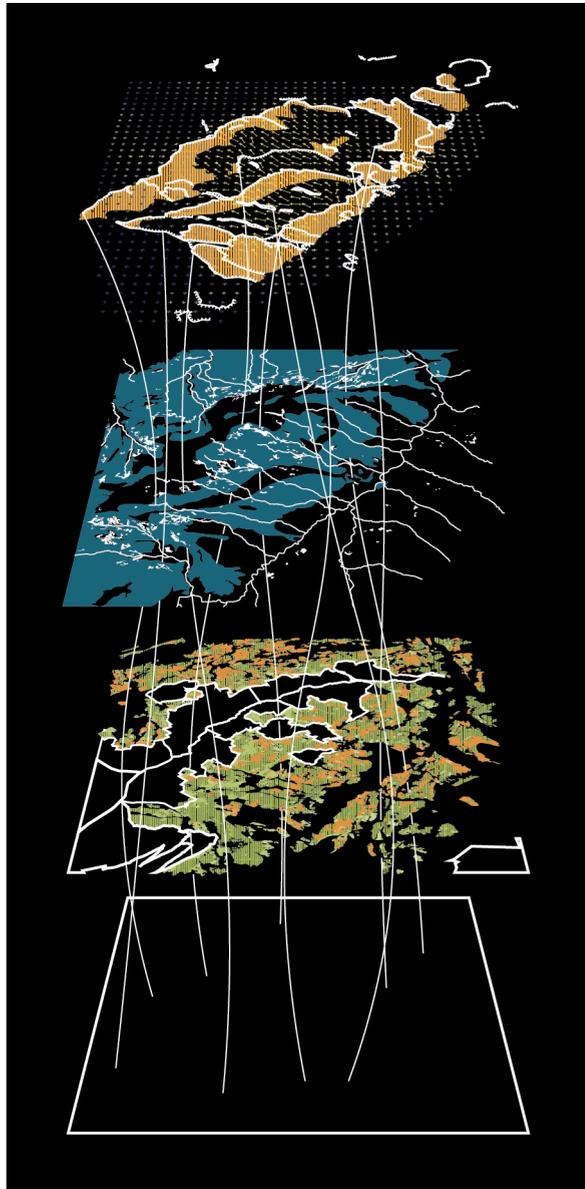
Together, these perspectives, both main and minor, form a composite mosaic reading of the landscape that foregrounds the material, eco-social, and imaginary dimensions of the territory along the analytical framework from chapter 1. Where this chapter reveals latent narratives in the landscape, the next chapter – *Actors and Processes* – shifts the focus toward the actors and systemic interrelations that co-construct this landscape. It builds upon the situated knowledge explored here, rendering it more systematic through an actor-process framework across spatial scales and temporalities.

Taken together, Part 2 aims to provide a holistic view of Lumnezia: grounded in the material and cultural landscape itself, and unfolding the dynamic constitution through relational and processual logics. A manifesto of what's at stake concludes the (Un)Learning from Lumnezia, and sets the stage for the design and refuturing chapters in Part 3, *Walking-With*.

Figure 40. Hidden layers of the landscape

Figure 41. Lumnezia valley. View from
Pez Mundaun southwards. from:
(Whgler, 2016)

Figure 42. Unused barns in the village
of Vella

Figure 43. Vacation homes outside the
village of Lumbrein

In Plain Sight:
Introduction to Lumnezia

Lumnezia is a valley in Switzerland, part of the Surselva region in the Canton of Grisons. The valley is drained by the Glogn river, which flows into the Rhine Anterior, forming part of the Rhine. The valley is split into two municipalities: Lumnezia and Vals, accounting for geographic, historic and linguistic reasons: the people of Vals speak German, while in Lumnezia Romansh is the local language. This minority language is related to Italian, stemming from Latin. The name of the valley translates to English as the valley of light.

The two sides of the Glogn river are very different. The river runs in a canyon below the main plains of the valley, largely unobstructed but hemmed in by forests. The right side, east of the Glogn is steep and sparsely populated. The left, western side hosts the main plateau of the valley, where most of the agricultural lands, villages, and the main road are located.

The plateau is mostly not flat, but at a steady 15 degree incline. This plateau is dissected by small streams which have eroded notches into the landscape, which are forested. Apart from these stream banks, the landscape is mostly open and covered in meadow and pasture lands, featuring a lot of small barns and huts, called *Meiensässe*, see them in the lower half of Figure 41. These barns were historically used for living space, hay and tool storage, and stables for cows and goats.

A prominent land use and infrastructure in the higher parts around Pez Mundaun are ski lifts and slopes. While most of the skiing area is on the north side of the mountain toward Obersaxen, two ski lifts connect Vella with Triel and Pez Plauncas, allowing access to the rest of the skiing area and thus ski tourism development in Vella. Ski slopes also link the peaks with the main villages on the plateau. Because of the south facing slope, snow security and quality is impacted by sunlight.

Topographically, Lumnezia is not particularly remarkable among other valleys of the Alps. It is in the specific bio-physical and socio-ecological processes at play, that make the valley unique among the Alps. The varying geography of the Alps leads to local particularities and unique values for every valley. Because of this mix of – at first perceived – normalcy, and deep particularities of the valley, Lumnezia is an ideal site to approach the research question in this thesis.

Apart from spatial factors, historic developments also shape the valley, and the Alps more broadly. Figure 46 is an accounting of the main history of the Alps and the Lumnezia valley. Both the spatial and temporal overview is enriched on the following pages with deeper investigations of the territory.
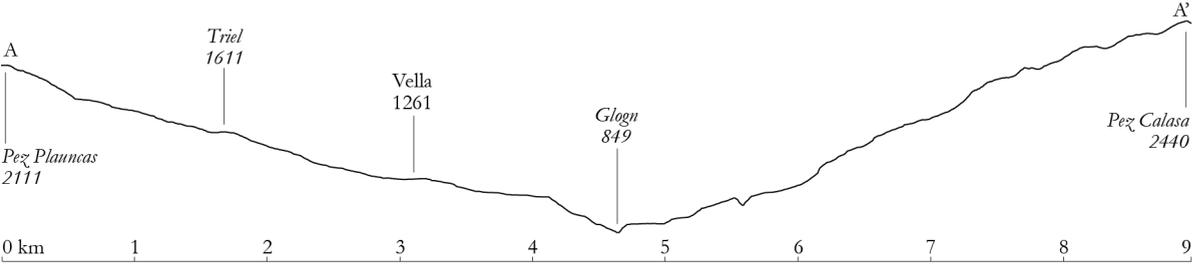

Figure 44. AA' Landscape section across the Lumnezia valley.

Figure 45. Overview over the northern part of Lumnezia, and Pez Mundaun.

1 km

— rivers and streams
— ski lifts
▢ pastures and meadows
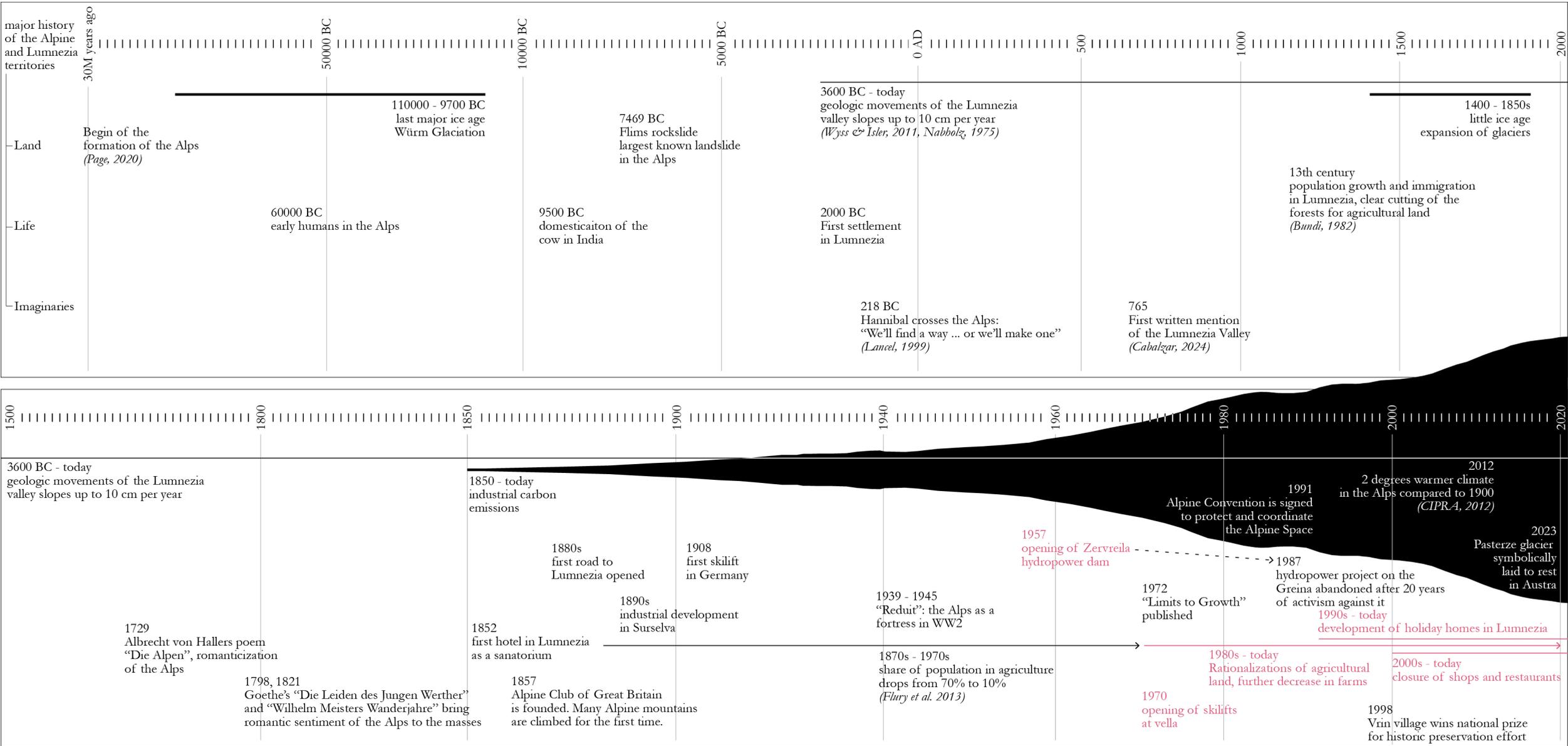▢ forest

Main History of the Alps and Lumnezia

major history
of the Alpine
and Lumnezia
territories

30M years ago

50000 BC

10000 BC

5000 BC

0 AD

500

1000

1500

2000

—Land

Begin of the
formation of the Alps
(Page, 2020)

110000 - 9700 BC
last major ice age
Würm Glaciation

7469 BC
Flims rockslide
largest known landslide
in the Alps

3600 BC - today
geologic movements of the Lumnezia
valley slopes up to 10 cm per year
(Wyss & Isler, 2011, Nabholz, 1975)

1400 - 1850s
little ice age
expansion of glaciers

—Life

60000 BC
early humans in the Alps

9500 BC
domesticaiton of the
cow in India

2000 BC
First settlement
in Lumnezia

13th century
population growth and immigration
in Lumnezia, clear cutting of the
forests for agricultural land
(Bundi, 1982)

—Imaginaries

218 BC
Hannibal crosses the Alps:
"We'll find a way ... or we'll make one"
(Lancel, 1999)

765
First written mention
of the Lumnezia Valley
(Cabalzar, 2024)

1500

1800

1850

1900

1940

1960

1980

2000

2020

3600 BC - today
geologic movements of the Lumnezia
valley slopes up to 10 cm per year

1850 - today
industrial carbon
emissions

2012
2 degrees warmer climate
in the Alps compared to 1900
(CIPRA, 2012)

1991
Alpine Convention is signed
to protect and coordinate
the Alpine Space

1957
opening of Zervreila
hydropower dam

1987
hydropower project on the
Greina abandoned after 20 years
of activism against it

2023
Pasterze glacier
symbolically
laid to rest
in Austra

1729
Albrecht von Hallers poem
"Die Alpen", romanticization
of the Alps

1880s
first road to
Lumnezia opened

1908
first skilift
in Germany

1972
"Limits to Growth"
published

1990s - today
development of holiday homes in Lumnezia

1890s
industrial development
in Surselva

1939 - 1945
"Reduit": the Alps as a
fortress in WW2

2000s - today
closure of shops and restaurants

1852
first hotel in Lumnezia
as a sanatorium

1980s - today
Rationalizations of agricultural
land, further decrease in farms

1798, 1821
Goethe's "Die Leiden des Jungen Werther"
and "Wilhelm Meisters Wanderjahre" bring
romantic sentiment of the Alps to the masses

1857
Alpine Club of Great Britain
is founded. Many Alpine mountains
are climbed for the first time.

1870s - 1970s
share of population in agriculture
drops from 70% to 10%
(Flury et al. 2013)

1970
opening of skilifts
at vella

1998
Vrin village wins national prize
for historic preservation effort

Figure 46. Main history of the Alps and
Lumnezia valley, a deep timeline from
the formation of the mountain range to
today.

Geology

Main History: Formation of the Alps

The Alps formed around 30 million years ago through the subduction of the Adriatic plate under the lighter Eurasian plate, lifting the latter upwards and thus folding the Alps (Dal Zilio et al., 2020; Rüegg, 2020).This movement of the Adriatic plate is caused by the larger African plate moving northwards, which also causes the folding of the Cordillera and Pyrenees in Spain, the Apennines in Italy, the Dinarides and Hellenides on the Balkan peninsula, and the Atlas mountain range in Morocco, Algeria and Tunisa (Coward & Dietrich, 1989; Dewey et al., 1989, see Figure 47).

On a smaller scale the Lumnezia valley and the wider Surselva region are host to the Glarus Thrust, a major thrust fault forming many of the mountains in the north of Surselva. Thanks to it's accessibility and visibility it is one of the best studied thrust faults in the world and a protected UNESCO heritage site. It served as a major piece of evidence to explain the formation of the Alps. The Lumnezia valley itself is a moraine landscape, shaped by glacier movements from the ice ages (Wyss & Isler, 2011).

Minor Story: Shifting grounds

The local geology of the Lumnezia valley presents a very fast geological timeframe. The southern flanks of Pez Mundaun are sinking at a rate of 2 – 10 cm per year, the church at Pleif, the oldest in the valley dating back (in parts) to ca. 840 AC, has seen movements of up to 20 cm per year (Noverraz & Bonnard, 1998; Wyss & Isler, 2011, p. 50). Additionally, the area of around 25 sqkm is also moving at up to 5 – 10 cm per year towards the valley floor, as the mass is being eroded by the Glogn river and thus can't settle (Wyss & Isler, 2011), see Figure 48.

This continuous movements leads to a long-term instability of the ground, which is most apparent at the Pleif church, which had to be rebuilt several times because of seismic activity and is now reinforced with building anchors. In general, with proper maintenance and care the buildings may stay intact, wooden buildings are less susceptible to strains. But, all buildings will fall apart rather soon than later without maintenance, which puts a lot of the unused old agricultural *Meiensäss* barns in the meadow landscape at risk of collapse.
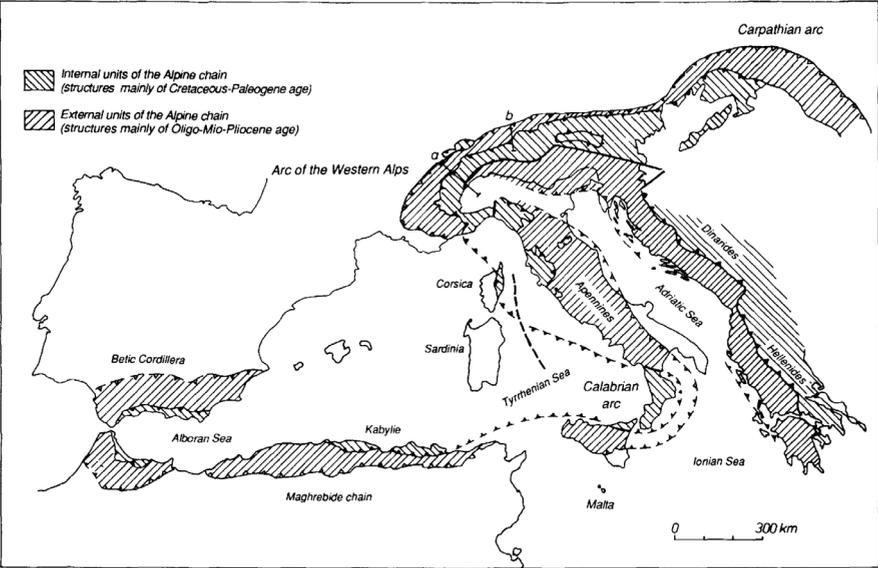
Figure 47. The Alpine chain in western Europe, showing the mountain ranges formed through the collision of the African plate and subduction of the Eurasien plate. source: (Coward & Dietrich, 1989, Figure 1)
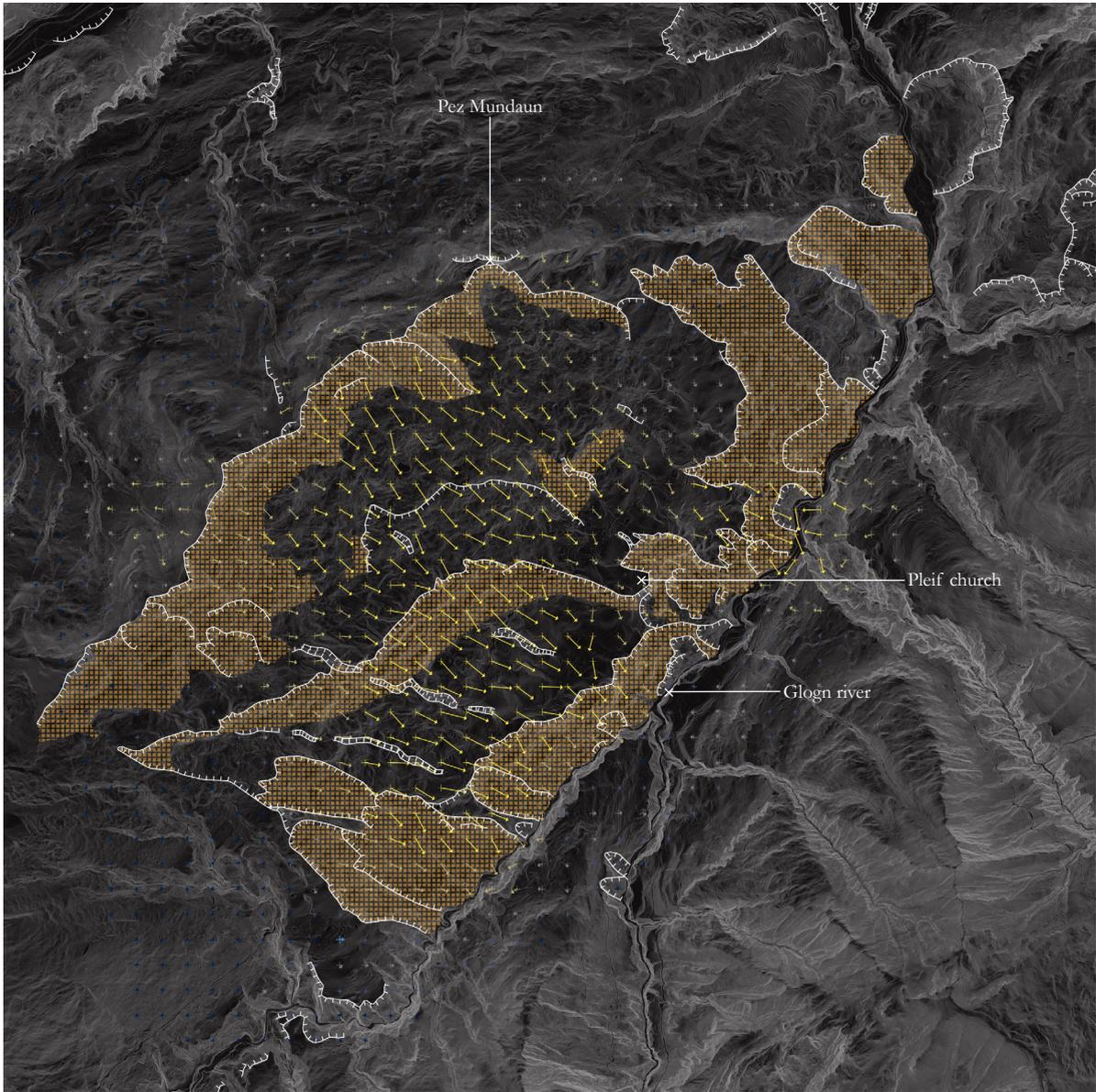
Figure 48. Sfting Grounds. Ground movements of the Pez Mundaun flanks in the Lumnezia valley

1 km

- slippage mass
- ground movement <1cm/a
- ground movement >6cm/a
- Fault lines

Wetlands

Main History: Emerald green pastures

The iconic imagined landscape of the Alps is dominated by green mountain pastures or by white snow packs. Both of these types need water to exist. Scarcity of water is not something that ordinary people in the Alps usually worry about, it is assumed to always exist. When water and its scarcity or overabundance are discussed, it is in the form of glaciers (melting) or mountain streams (flooding). The green pastures are mostly taken for granted, even through they are very sensitive to changes in water availability, as they are mostly fed by unreliable rain water. Alternative images of the Alpine landscape in the form of wetlands are mostly hidden, as wetlands are pictured as flat, not sloped.

Figure 49. Map from 2017, indicating the Cauma Su wetlands (centre, horizontal blue dashes), but not Paliu Marscha wetlands at Triel (right, roughly where markings "1616"and "1595" are set). soure: (swisstopo, 2017)

Minor Story: wetlands in the margins

Groundwater defines any landscape. The availability of water in the soil determines the functions this soil has, what lifeforms it can host, what plants can grow on top and inside, how many nutrients it stores and transports, and how it erodes. On slopes, the groundwater is moving comparatively fast downhill, taking nutrients and soil particles with it. Moraine landscapes like the Lumnezia valley are important landforms for groundwater storage (Hood & Hayashi, 2015; Somers & McKenzie, 2020). This abundance of groundwater is usually below the topsoil layer, but because the moraine rock layer is pretty compacted water gathers in the lower soil layers. Under these conditions, whenever the slope flattens out abruptly, groundwater pools, infiltrating the topsoil, leading to marshy conditions, and thus forming alpine wetlands (Hangmoor, n.d.).

As Figure 50 shows the slopes of Pez Mundaun are predisposed for wetlands formation, specifically of hanging bogs, thanks to large areas of moraine geology and comparatively gentle slopes under 15 degrees on all sides. Many of these wetlands are very small and barely discernible from a distance, because open water bodies are very small and fragmented. Even then, their distinct vegetation and the avoidance by cows and farmers makes them stand out. To increase productivity of the land, be it for agriculture or ski slopes, they are often drained and, because their peat layers decay without groundwater, they disappear. Until very recently, many wetlands weren't even registered on national maps (see Figure 49 from 2017).
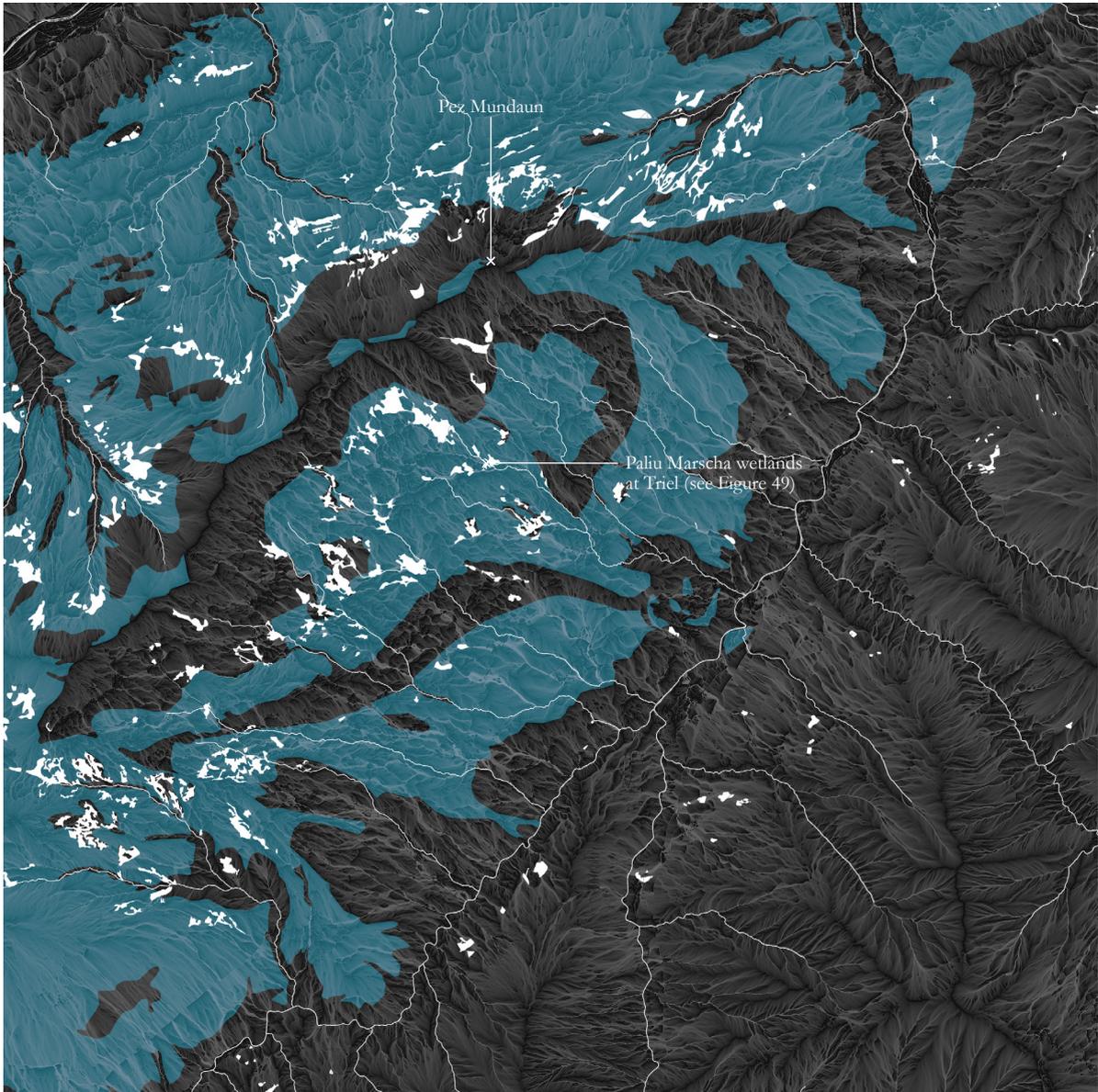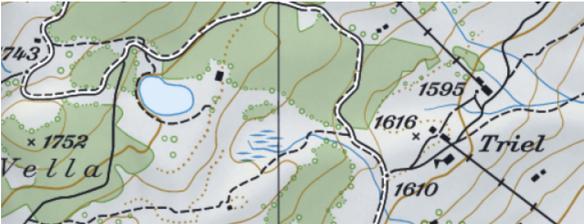
Figure 50. Wetlands in the margins. prevalence of wetlands around Pez Mundaun on geological moraine layers.

1 km

- ▬ moraine layer
- ▭ wetlands
- ▬ streams
- ▬ water flow paths

Figure 51. Wetlands at Paliu Marscha

Figure 52. Wetlands at Cauma Su

Figure 53. Hanging bog at Paliu Nera

Figure 54. Natural pond at Fontauna Nera

Landscape Care

Main History: Calorie Producers

Over the last 50 years, Alpine agriculture has undergone a profound transformation. The intensification of production and consolidation of farms have reshaped the landscape from a mosaic of small plots to larger, more uniform units, which can be used more efficiently (Cabalzar, 2024; Flury et al., 2013). In a personal interview, the Lumnezia-based cheesemaker Mario Albin told me he processes four times as much milk now as in the 1990s.

Yet, the imagery by marketing campaigns tell a different story, not of the meadows as calorie producers, but of cows in idyllic landscapes (see Figure 55) This framing evokes care, tradition and ecological balance, which is still the case for traditional farming, but not for the underlying system which prioritizes volume and throughput.

Figure 55. Adverisement for cheese, with idyllic landscapes and cows. From: (Merkblatt - Schweizer Alpkäse, 2011)

Minor Story: Ecologies of Grazing Lands

Dairy pasture landscapes are often treated primarily as zones of agricultural productivity. Yet re-search by Pornaro et al. (2021) reveals that these grasslands are also key reservoirs of plant biodi-versity—particularly when managed through traditional, small-scale systems. Their study of 49 mountain dairy farms found that pastures, especially those with low livestock densities and rotational grazing, supported significantly higher species richness and diversity than intensively mown or heavi-ly fertilized meadows. In particular, fields fertilized with solid manure and cut once or twice per year showed greater ecological variety than those treated with slurry or subjected to frequent mowing.

This biodiversity is not incidental but co-produced through everyday maintenance practices. Grazing animals, farmers, and plant communities form a dynamic network of care that sustains these ecosys-tems. Figure 56 uncovers this interplay as a mosaic of agricultural practices across the landscape, illustrating how diversity in land use translates into ecological diversity. The high-alpine zones—used for communal grazing during the summer months and left to rest for the remainder of the year—are particularly rich in these ecological benefits. These seasonal rhythms of use and recovery align closely with the conditions identified by Pornaro et al. as supporting plant richness. Rather than a static product of nature, the pasture emerges as a collaboratively maintained landscape. As Pornaro et al. argue, supporting the economic viability of such farms is essential—not just for rural livelihoods, but for the ongoing care of ecological complexity in Alpine grasslands.
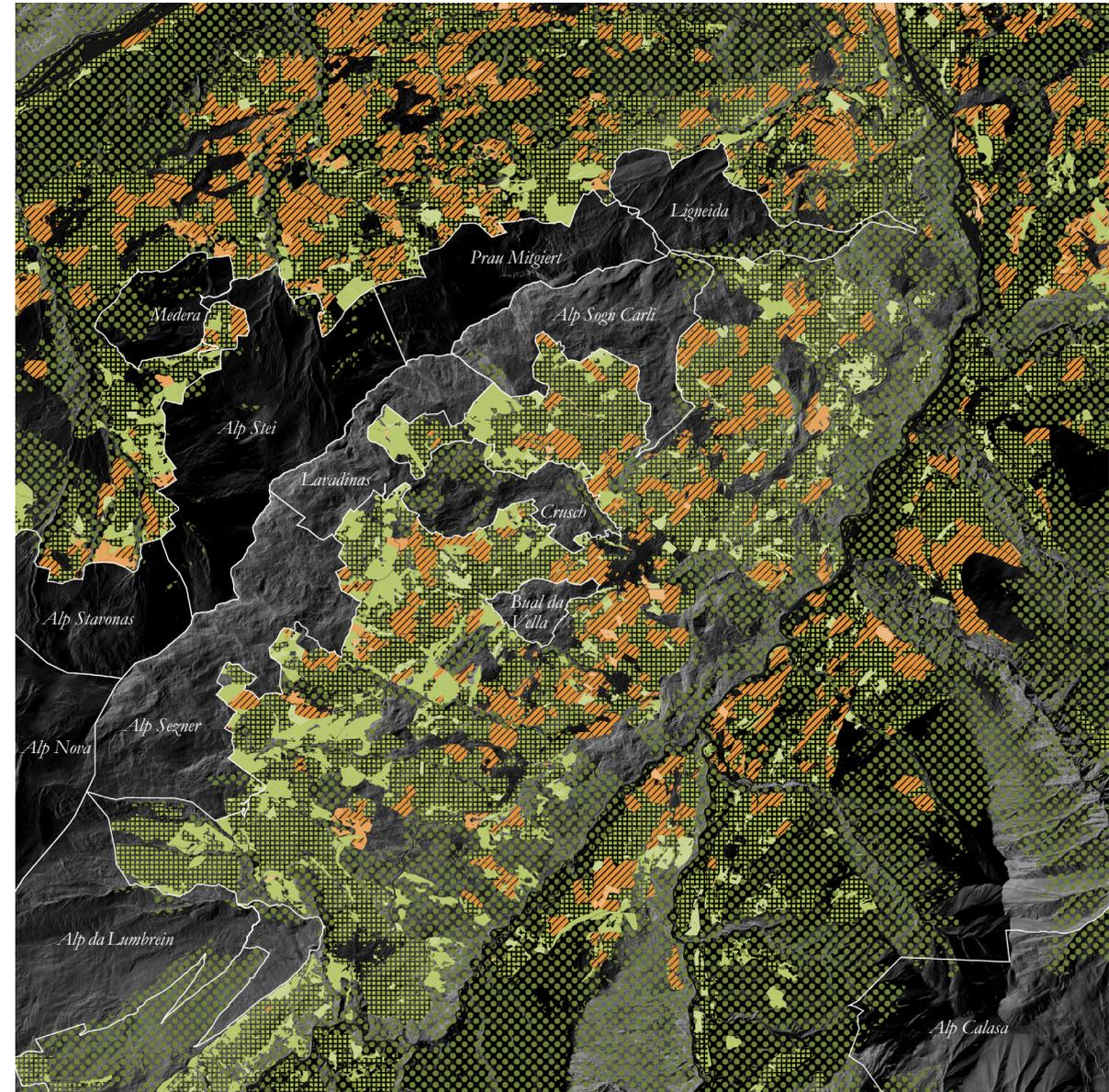
Figure 56. Diverse forms of landscape care

conventional agriculture:
- pastures
- meadows
- fields

organic agriculture:
- pastures
- meadows
- fields

- forest
- summertime pastures

1 km

Figure 57. Ancient cow herding road, overgrown because of disuse

Figure 58. Ancient cow herding road, in use as an access road for agricultural vehicles and machines

Figure 59. Stream chanelled underground
to make way for ski slopes above

Figure 60. Reservoir above Triel for use
by snowmaking equipment

Names and Identities

Main History: Tools for orientation

Placenames in the Alps are important for distinguishing places in the mountains. Local products carry the name of their origin, contributing to an increased name recognition of the area: Emmentaler cheese originates from the Emme valley in Switzerland and it's the one thing the place is known for today. Placenames can be altered, such as the town of Zermatt, who added the part "paradise" to several placenames to market them for ski tourism (Woodman, 2014, p. 14). In the ski area of Obersaxen-Mundaun, which spans across Pez Mundaun, not just the name of the mountain is appropriated, but some placenames are featured prominently for wayfinding and commercial purposes, like the ski restaurant *Jeranti's@Waschchrüt*, or the Aprés-ski bar *Cantorta Alp Sezner*. Duncan Light, a scholar of critical toponymy (the study of placenames) sees the embrace of placenames by tourism marketing strategies as appropriations "into broader circuits of the production and consumption of tourist space" (Light, 2014, p. 141).

Minor Story: Lost memory of the land

Place names – toponyms – are not just markers in the landscape, they imbue the land itself with meaning and they connect culture, history and identity with space. Ulla Hakala et al. (2015) found in a large survey, that many people attach importance to the placename they live, and that changing or losing the name also means losing part of the place's history. In Alpine agriculture in Switzerland, every meadow and pasture has a name. But as the land is consolidated, these names fall out of use, and end up being forgotten. It is this concern that lead to Martin Cabalzar (2024) collecting all of the placenames in Lumnezia, as people remembered them. The result is a book with over 4000 names, with almost half of those names not found on any map (they are mapped in Figure 61).

Placenames carry meanings. The names in the open landscape often relate to a geographic feature such as a rock, plain, or peak, others mark the presence of water ("paliu" means march or bog, "fontaunta" is a spring), and again others reveal farming practices ("cauma" is a gathering space for animals, "pastira" is a night pasture i.e. where cows like to sleep). They are an archive of the landscape, sometimes enduring over centuries.
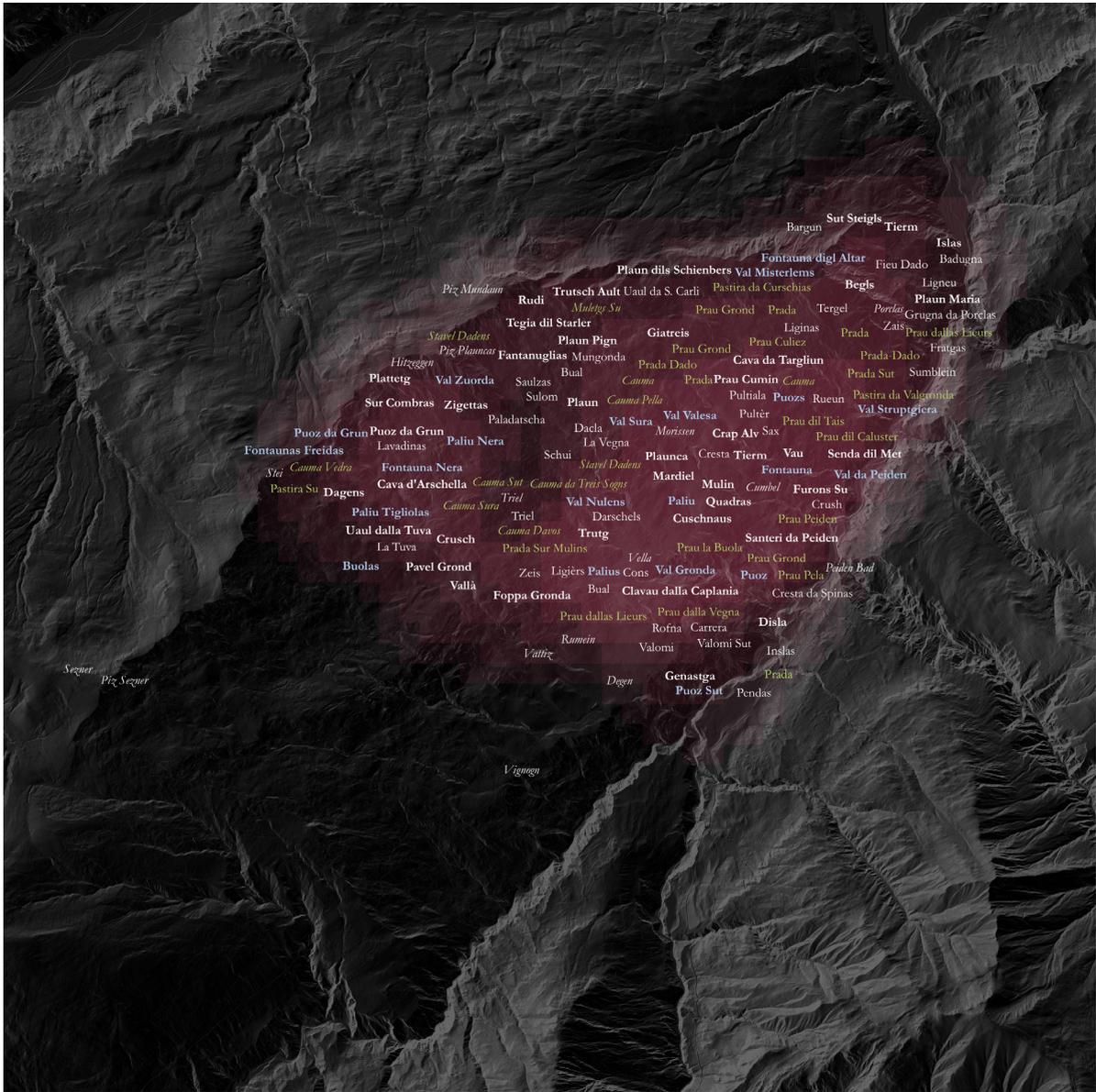
Figure 61. Placenames, known and forgotten, carrying past meanings

1 km

- water-related names
- agriculture-related names
- low frequency of hidden names
- high frequency of hidden names
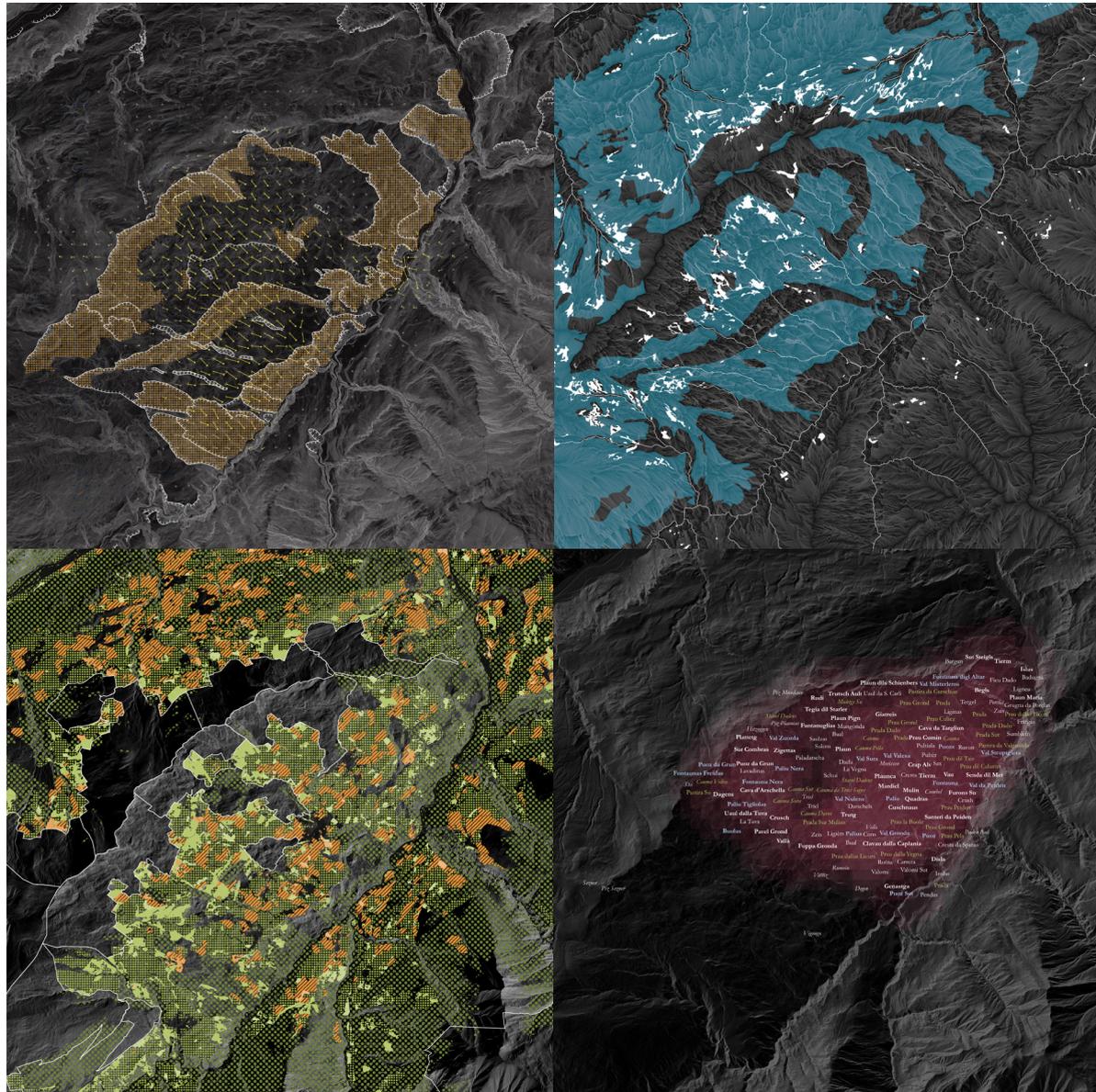
A Mosaic of Viewpoints

The aim of this chapter was to investigate hidden stories and forms of the landscape of Lumnezia and the Ped Mundaun mountain. From an introduction of the site and investigating it's mainline histor-ical events, the analysis turned to main and minor stories within the themes of geology, wetlands, landscape care, and names and identities, which align with the dimensions od land, life, and imagi-naries of the territory.

I investigated the discipline of geology in the valley and found a significant movement of the land-scape up to 10 cm a year, which has far-reaching implications especially for human structures: any building or infrastructure that is not properly maintained will quickly fall apart, though the local ver-nacular of wooden construction is better suited to these seismic challenges. The local geology also allows for the formation of the wetlands, which cover much of the flanks around Pez Mundaun. At the same time, the wetlands are barely noticeable in the culture landscape and remain hidden.

Turning to landscape care, I mapped the production and maintenance of the culture landscape based on agricultural practices and found a diverse landscape of different ways of care, fostering a rich ecology. The agricultural tradition of the landscape also contributed to the many placenames that encode meaning and identity into the landscape. Both landscape care and toponyms are under threat, though, with increasing mechanization and consolidation of farming practices. Meanwhile, the wetlands on the margins provide many benefits such as water storage and ecological niches, but they need to be noticed to be protected.

These four stories of the landscape together inform a mosaic of viewpoints upon the land. Ian McHarg pioneered the approach of investigating space through layers, to find and recognize the re-lationships between human, cultural, and ecological, Natural elements of space. This chapter follows in McHarg's footsteps, with the caveat that the "layers" I investigated here don't have to necessarily create a unified look upon the landscape. A mosaic too is not made of one unified material, but assembled through many distinct elements which together form a bigger picture.
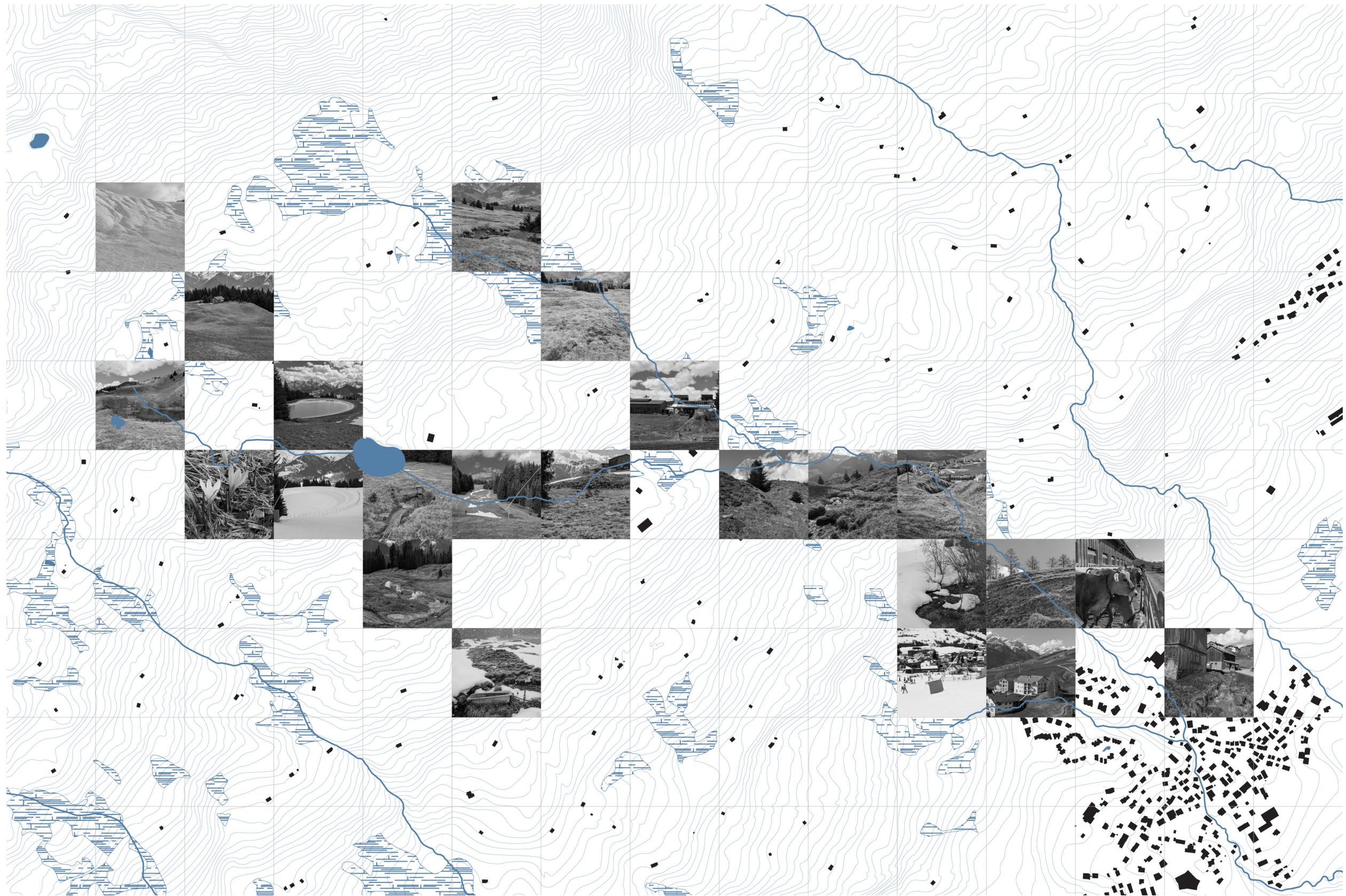
Figure 62. local scale qualities

150m

Chapter 4

Actors & Processes

After exploring the landscape of the Lumnezia valley through forensic approaches, uncovering minor stories and assembling a mosaic view of the landscape in the previous chapter, let us now turn to a more systematic approach. This chapter aims to unpack the actors and processes, which co-construct the Lumnezia valley. Various mapping approaches help tracing the processes, and the actors within.

In the first half of this chapter, I explore territorial processes – ones which shape the material layers of the landscape. Through relating the products to one another, and considering the knowledge from previous chapters, they allow understandings of the semiotic and relational layers of the territory as well. A systemic section based around the water cycle first introduces the systemic relationships between the hydrosphere, ecosystems, habitation, agriculture, and tourism. Another systemic diagram, mapping these processes on an annual cycle allows seasonal patterns and relationships to emerge. Finally, mapping these processes on space in four scales – body, local, regional, and European – shows global and local relationships within between processes.

The second half of the chapter introduces 51 actors, human and non-human, which play a role in the landscape, specifically related to water and the other processes outlined in the first half. Out of this group, I select a smaller "core" group of 15 actors, which have (or should have) the largest agency in the water landscape. I characterize each actor along their aims, problem perceptions, and agency, which provided important insight for the later design and refuturing chapters. Finally, I relate the actors to space and one another using the terra forma approach of mapping the co-construction of living landscape.

Finally I will close the chapter with reflections upon the parliament of things and how this concept appears through the mapping of actors and processes in space.

Figure 63. Skilifts at Triel, Lumnezia

systemic section

regional scale map

local scale map

seasonality map
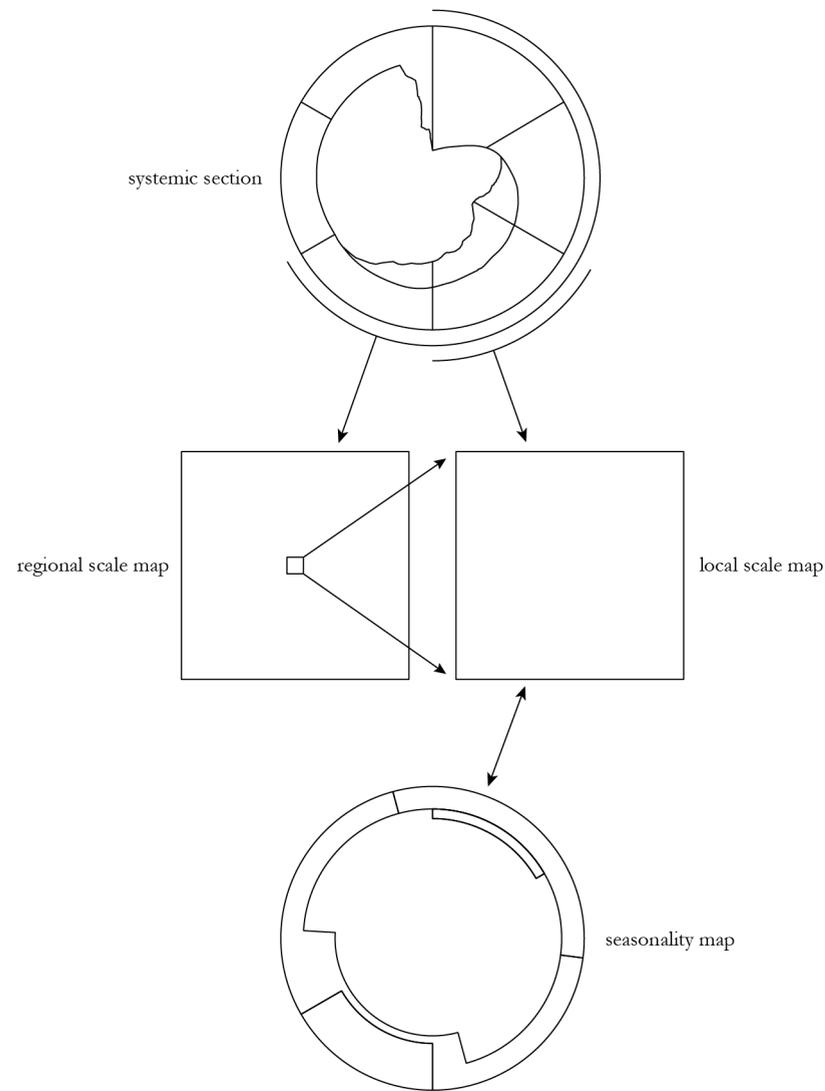
Territorial Processes across Scales

This section maps the systemic interrelations between water, ecosystems, habitation, agriculture, and tourism in the Lumnezia valley. Through three complementary methods—a systemic section, a seasonality diagram, and a multi-scalar mapping—it seeks to make visible the material forces and interdependencies that co-constitute the Alpine landscape. The goal is to understand territory not simply as a static physical backdrop, but as a material artifact: an outcome of overlapping biophysical and socio-ecological processes that unfold through time and space.

Water shapes the landscape physically through glaciation, accumulation, and groundwater movement, while also enabling vegetation growth and agricultural use. Ecosystems respond to and regulate these hydrological conditions, supporting biodiversity through dynamic interactions among species, soil, and climate. Habitation clusters in response to topography and agricultural viability, creating patterns of settlement and infrastructure. Agriculture, particularly dairy and pasture-based systems, modifies vegetation, nutrient cycles, and landforms through seasonal rhythms of grazing, mowing, and fertilization. Finally, tourism overlays this landscape with another temporal and economic layer, producing demands on land, infrastructure, and aesthetic value, while often amplifying existing pressures or introducing new forms of territorial intervention.

Each of these systems exerts a shaping force on the territory. They are not passive—they actively participate in territorialization processes: the ongoing production of territory through relations of control, access, meaning, and use. This approach expands upon Claude Raffestin's theory of territorialization, which emphasizes the role of human actors in shaping territory through energy, labour, and information. Here, territorialization is understood more broadly: not only as a socio-political process, but as one that is also ecological, material, and more-than-human. Territory, in this sense, is constantly produced and reproduced through an entangled web of actors—human and nonhuman, visible and latent.

Revealing these relationships through spatial and temporal mapping sets the stage for understanding how design—seen later in the thesis as a relational and political act—must begin from the situated knowledge of what is already at play in the material landscape.
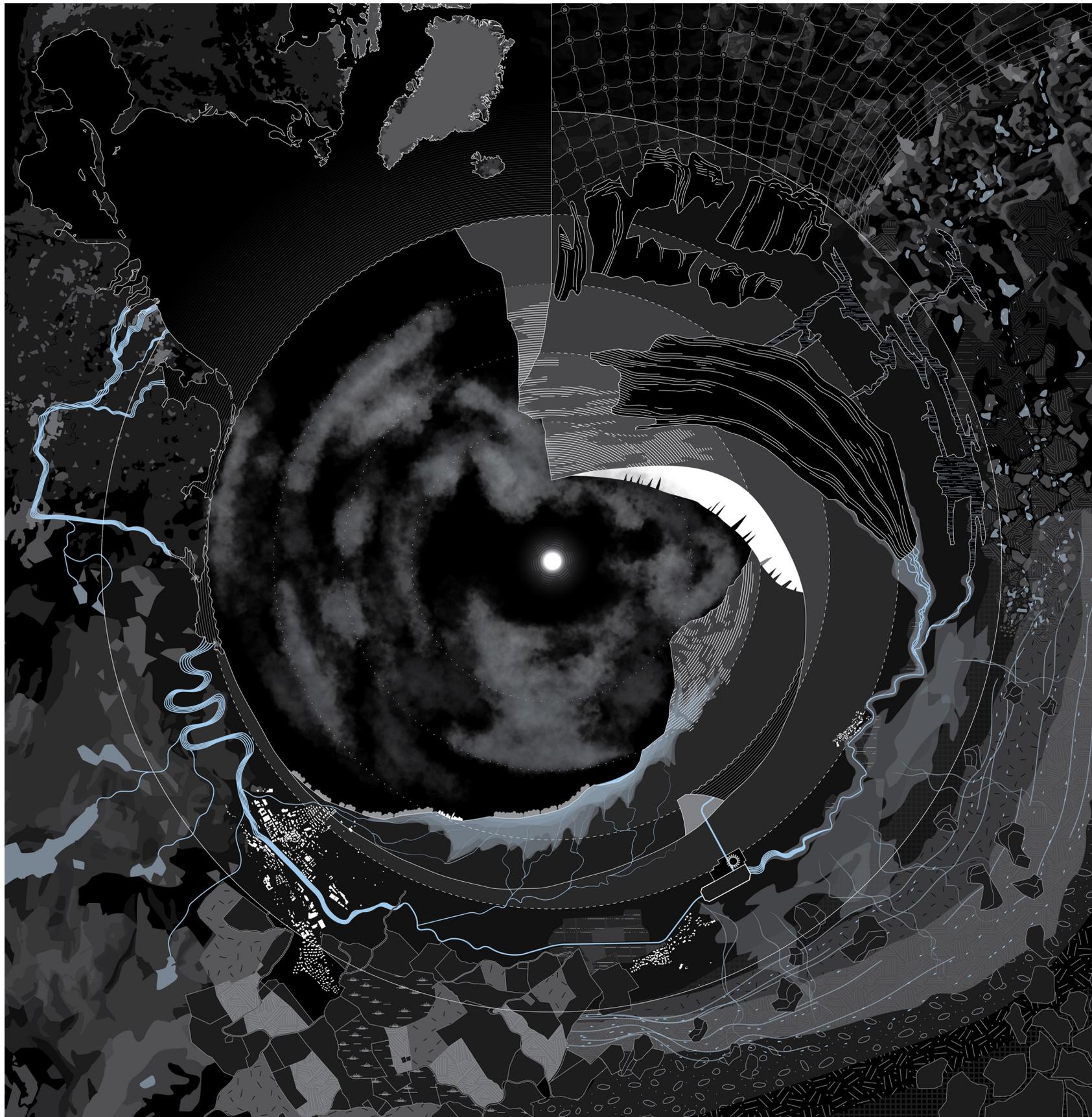
The main purpose of a systemic section is to map systemic relationships and intersections onto a typology of the landscape. This section is organized around the water cycles (clockwise) and vertical organization of space (atmosphere in the centre, soil in the periphery). This arrangement takes inspiration from the work of Alexandra Arènes, which she laid out in Terra Forma (2022): Mapping the critical zone through a terrestrial perspective, The vertical dimension of human activities, across soil strata, becomes apparent. It is to be read from the middle to the outside: starting from the atmosphere, diving into the surface layer and the ground that supports all of the systems.

radial distribution: height
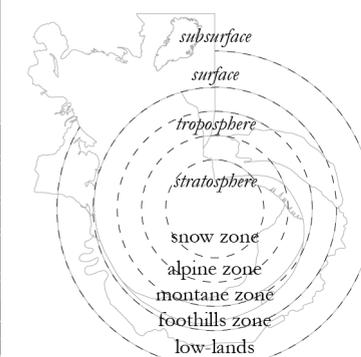
angular distribution: scale
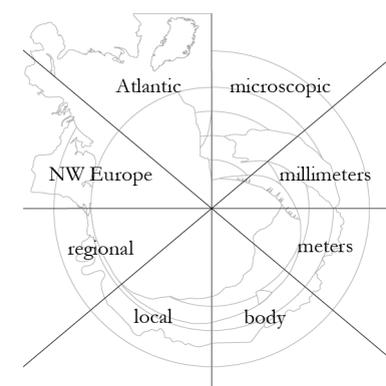
Figure 64. Systemic section

Systemic Section: Layers
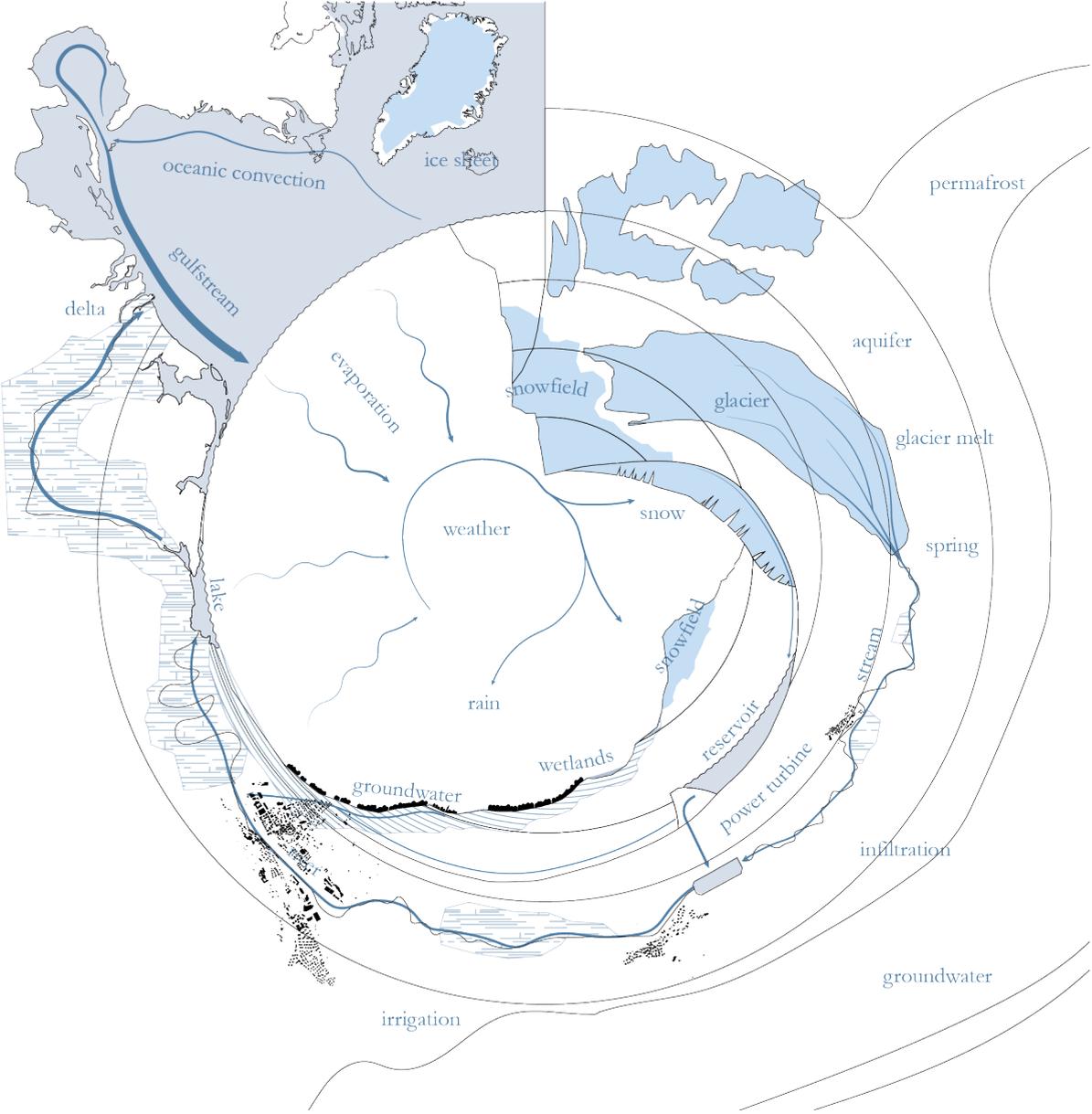
permafrost

oceanic convection

ice sheet

gulfstream

aquifer

delta

evaporation

snowfield

glacier

glacier melt

weather

snow

spring

lake

snowfield

rain

stream

wetlands

reservoir

power turbine

groundwater

infiltration

groundwater

irrigation

Hydrosphere

The dependence of the low lands on glacier water is apparent, but groundwater flows contribute substantially to river waters too, as Somers and McKenzie (2020) found. The snow zone is mostly dominated by the cryosphere. Soil conditions are wildly different between the alpine and snow zones and the foothills and low lands, depending on groundwater, nutrients, and the living inhabitants of the soil.

Hydrosphere

The dependence of the low lands on glacier water is apparent, but groundwater flows contribute substantially to river waters too, as Somers and McKenzie (2020) found. The snow zone is mostly dominated by the cryosphere. Soil conditions are wildly different between the alpine and snow zones and the foothills and low lands, depending on groundwater, nutrients, and the living inhabitants of the soil.
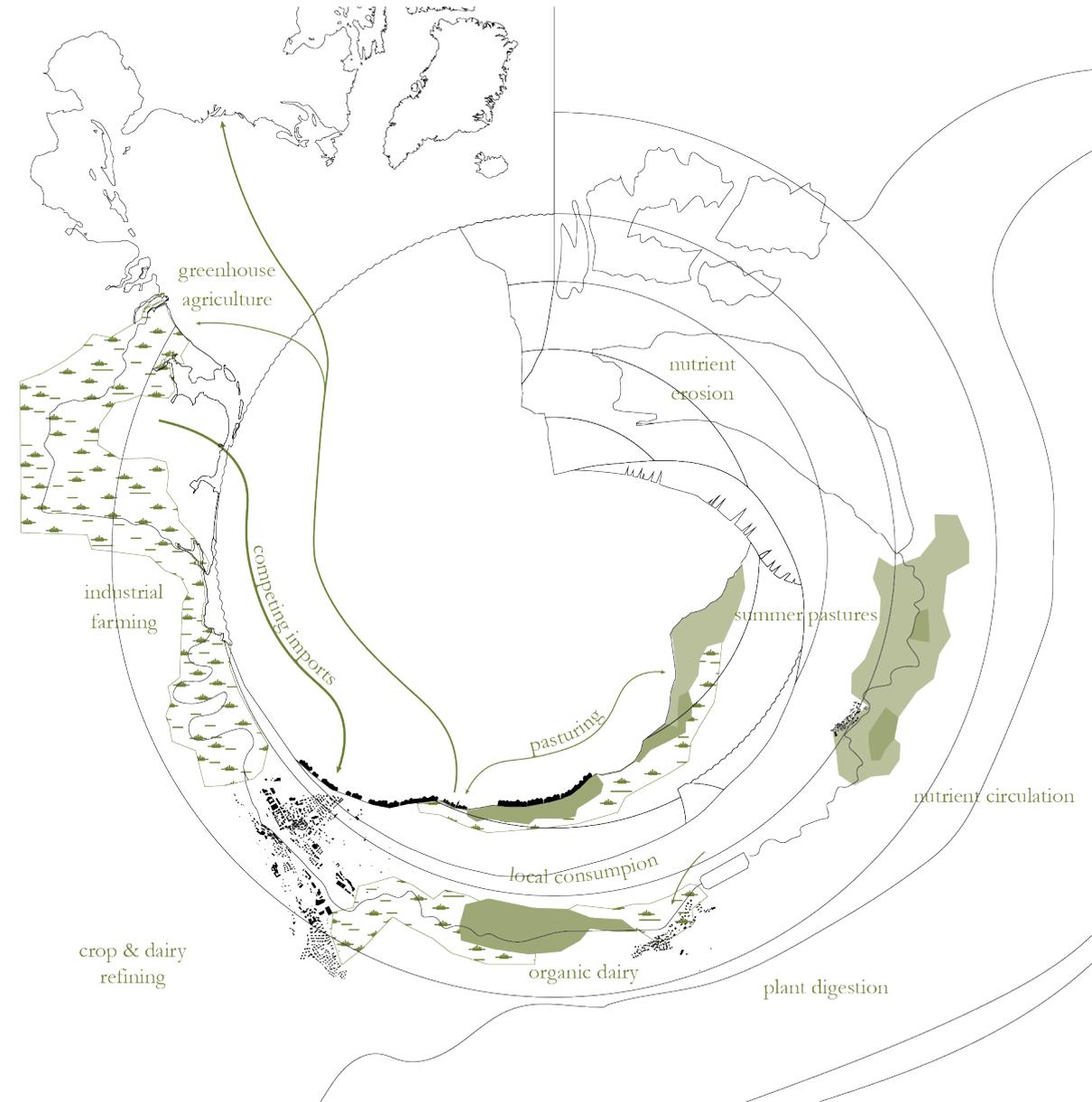
Agricultural Sphere

In low lands, the foothills and montane zones agriculture dominates the space, while alpine zones are mostly used for summertime pastures and organic farming. Dairy products are refined into higher-value exports as a response to competition by industrial dairy productions in the low lands.

Habitation Sphere

Human occupation is dependent on elevation: in foothill and montane zones (up to 1500m) settlements can be found, with larger cities in the valleys and beyond the Alps. A steady exchange of population takes place: inhabitants of the mountains emigrate and are replaced by pensioners and second home occupants. The dispersed settlements are slowly being abandoned in favour of better connectivity to services and employment.
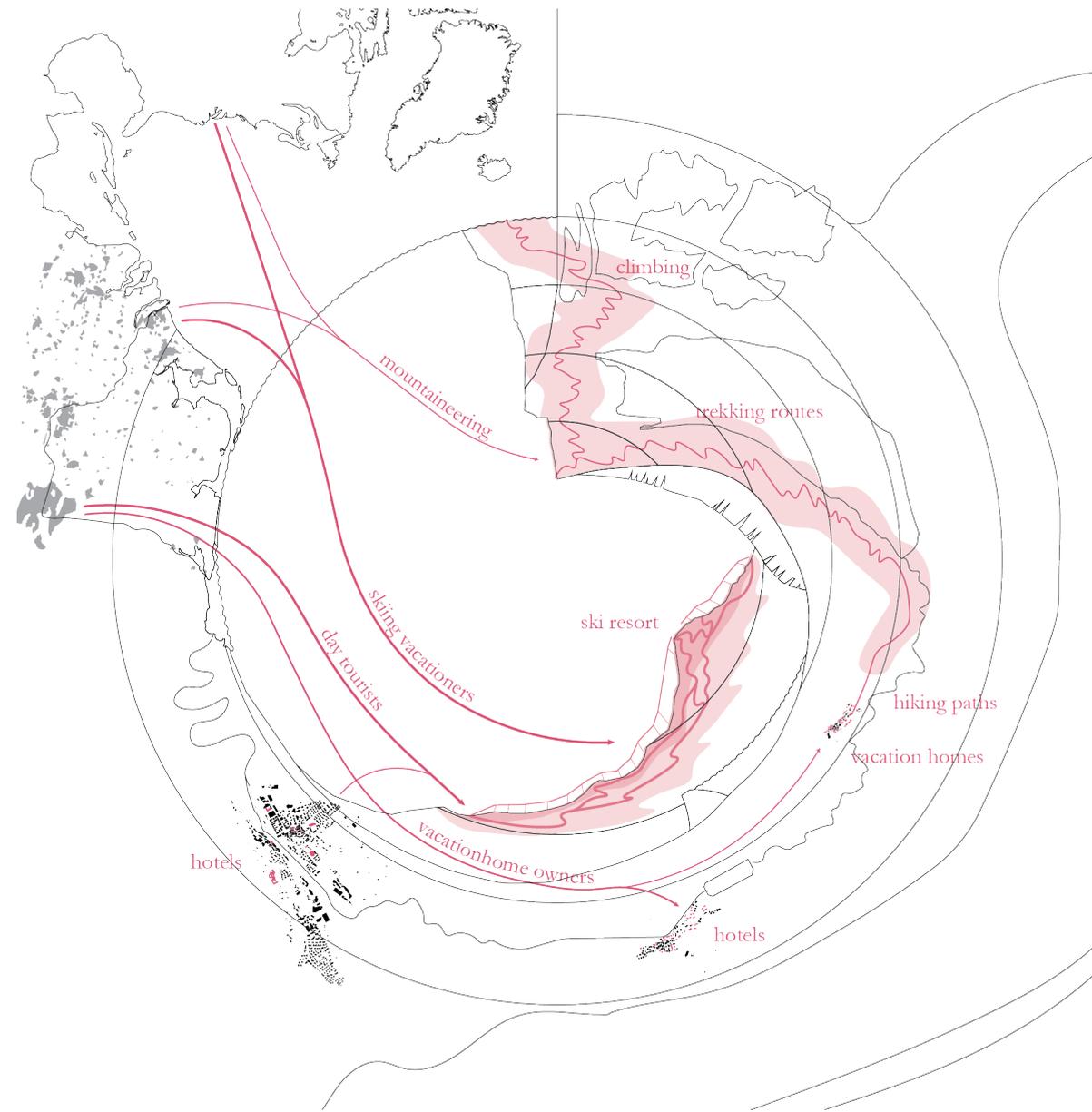
Touristic Sphere

The alpine zones are dominated by touristic resorts and their infrastructure, mainly for skiing. They attract day tourists as well as overnight guests, which leads to the development of hotels and conversion from primary to secondary housing. The more remote areas and snow zones are impacted by mountaineering activities.

Regional Scale: Processes

The region of Surselva is characteristic of the central Alps. The main valley runs along the Alpine arc with side valleys branching off and further subdividing like a fractal. The main urbanized areas meanwhile are found in the North-south running valleys, which host main transport links across the mountain range. Through its orientation Surselva is not host to a traffic artery, leading to peripheralization where the topography doesn't lend itself to ski resort development. Meanwhile, glaciers cover the highest parts of the surrounding massifs. Clusters of wetlands emerge, as I already explored in the previous chapter, thanks to particular geologies. Per chance many of these clusters overlap with ski resorts.

Figure 65. Regional networks of mobility, tourism, and water landscapes

- wetlands
- wetlands clusters
- glaciers
- skilifts
- ski resort area
- summer pastures
- road connections
- protected areas

8km
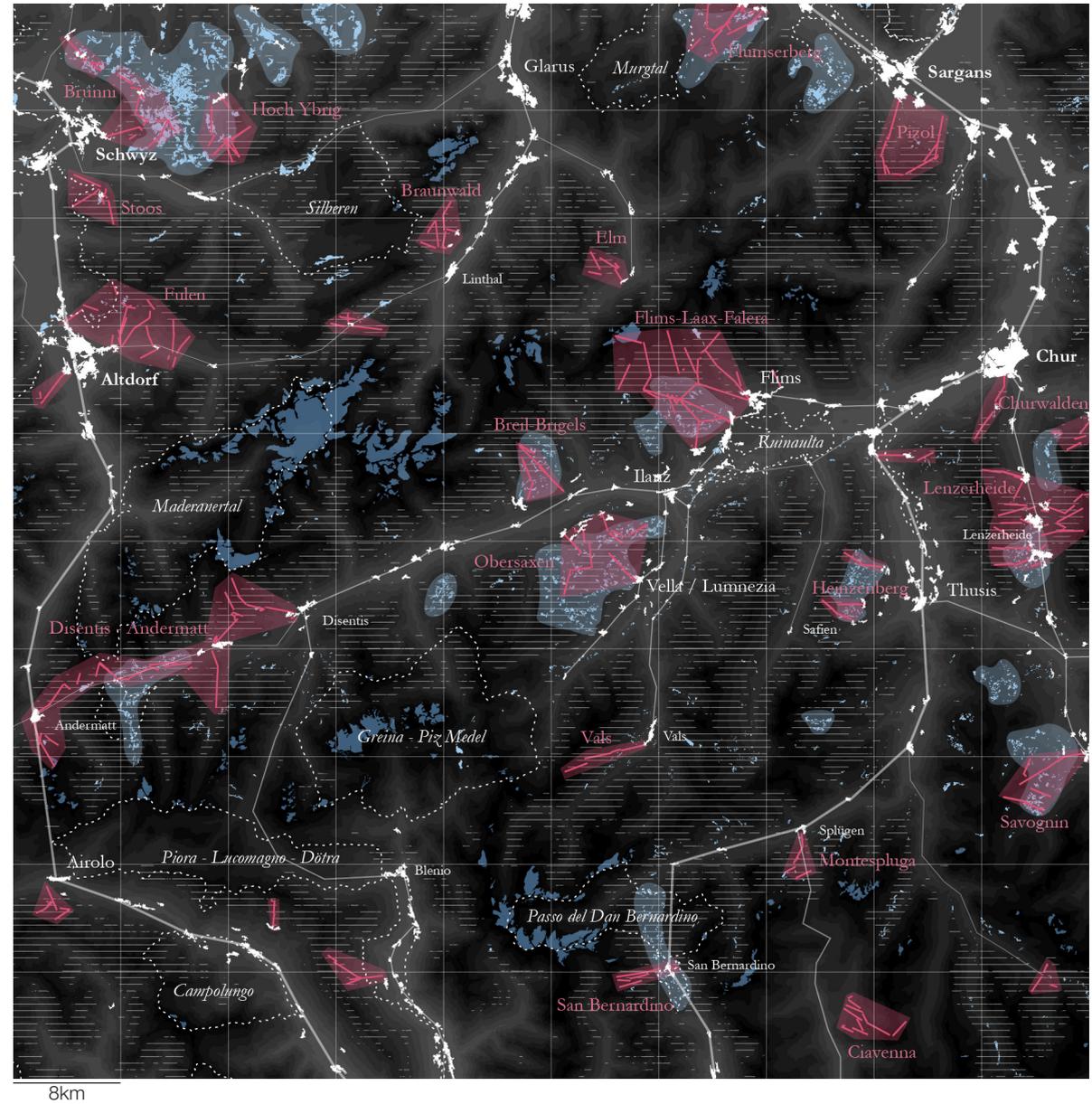
Local Scale: Processes

The local landscape above the village of Vella (bottom right of Figure 66) features unusually low lying summer pastures, which host forested areas and a cluster of wetlands. They drain into a stream running through the village. The same area is also used for skiing in the winter, with two lifts and a number of slopes connecting the peak at Pez Mundaun with the village.

Figure 66. Local landscape of ski infrastructure and pasture agriculture

▬▬▬	wetlands
────	streams
▐▐	reservoir
────	skilifts
▬▬▬	ski slopes
▬▬▬	summertime pastures
▦▦	forest

300m
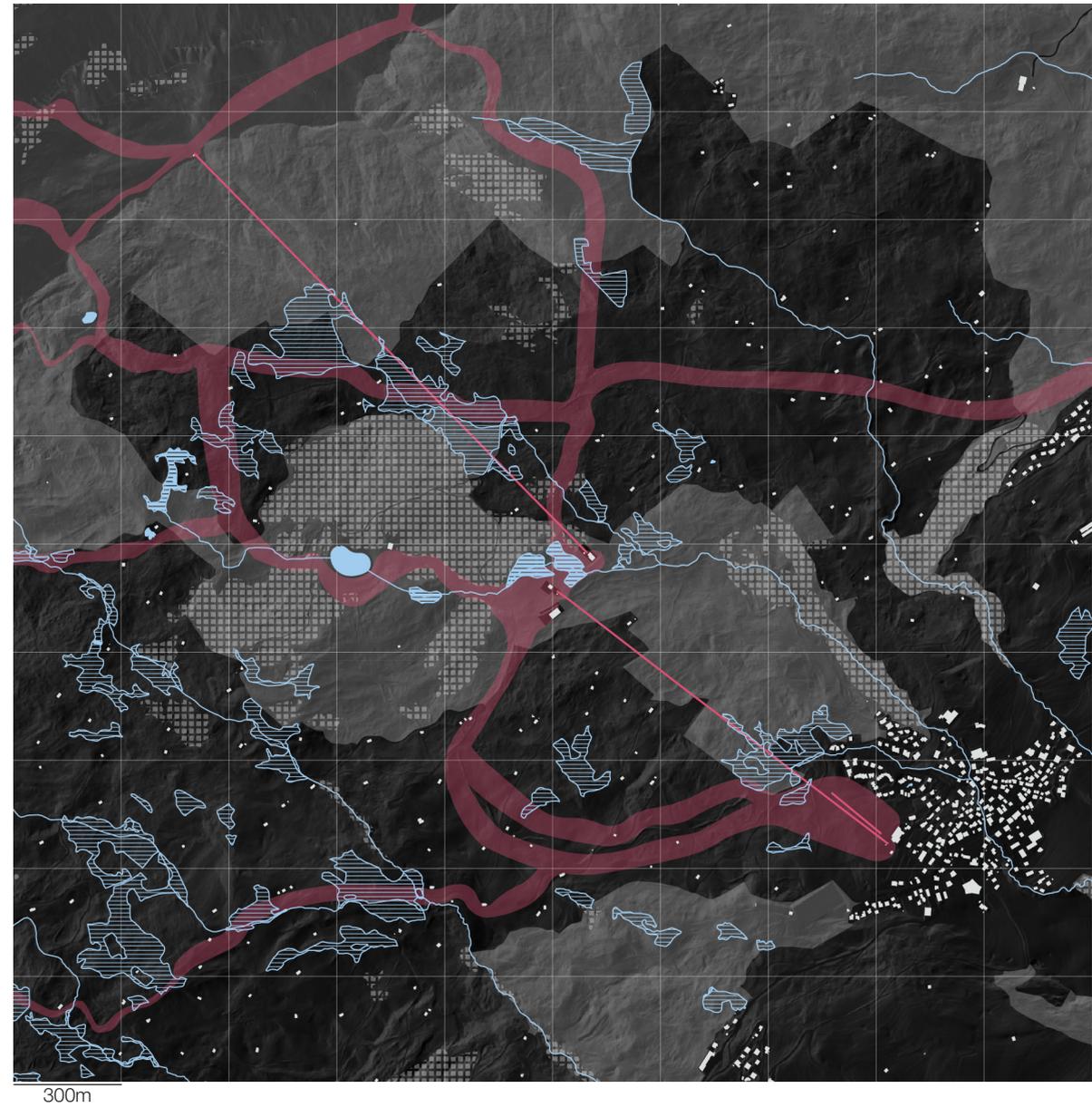
Mapping Annual Rhythms

Mapping the territorial processes onto an annual calendar uncovers seasonalities within each process, as well as overlapping periods where multiple or all processes are relevant. Overlaying precipitation and snowfall, overnight stays, and seasonal grazing patterns reveals to intense periods and two rest periods. During the winter, beginning in December and lasting until April is the winter skiing season, which obviously correlates with the period of snowfall, and high tourism numbers. The beginning and end of the winter tourism season however are marked by increasing uncertain snowfall, and thus the increased use of snow making. Following the winter tourism season is spring, a period of rest, where the ecosystem begins to grow and pollinate. Summer, again, sees high levels of activity, surprisingly with the highest number of overnight stays in July. The three months of July to September are the usual time of summertime pasture use, in this period farmers are most active in tune with the ecosystem and the water cycle, which sees the highest precipitation levels in August. Finally, October and November again mark a rest period.

Figure 67. Annual rhythms across the domains of water, agriculture, and tourism in the Lumnezia landscape

☐ precipitation
☐ overnight stays
☐ snowfall
☐ artificial snowmaking
☐ summer pasture

Actors of the Water Landscape

Fifty-one actors are identified as relevant to the culture landscape, each playing a part in this socio-ecological system. The selection of these actors is based on their playing a role in either water, ecosystems (mainly pastures, forests, wetlands), habitation (in the valley), agriculture, and tourism. Settling on the list of 51, I categorized them into six types. Three of these types form human categories: private actors, public ones, and civil society, following Roberto Rocco (2023). The other three, categorizing non-humans, follow the work of Mark Starik (1995) and Johanna Kujala et al. (2019), are: animal, vegetal, and forces of Nature. The distinction between animal and vegetal lies in the ability to move freely versus existing (mainly) in place. Soil organisms are either microbes, small insects or invertebrates, which are able to move in some capacity. Forces of nature denote the agency of the landscape, Gaia and the earth system. Each actor is further classified into a core group (inner hexagon), locally important (middle), and further important (outer hexagon).
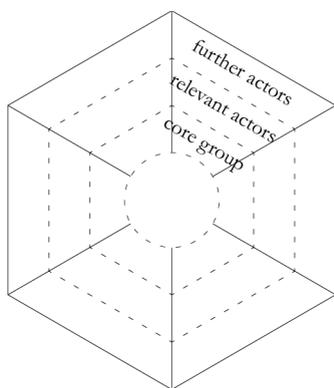
Figure 68. Actors of the Water Landscape

- ⬤ influence level high
- ◉ influence level medium
- ○ influence level low
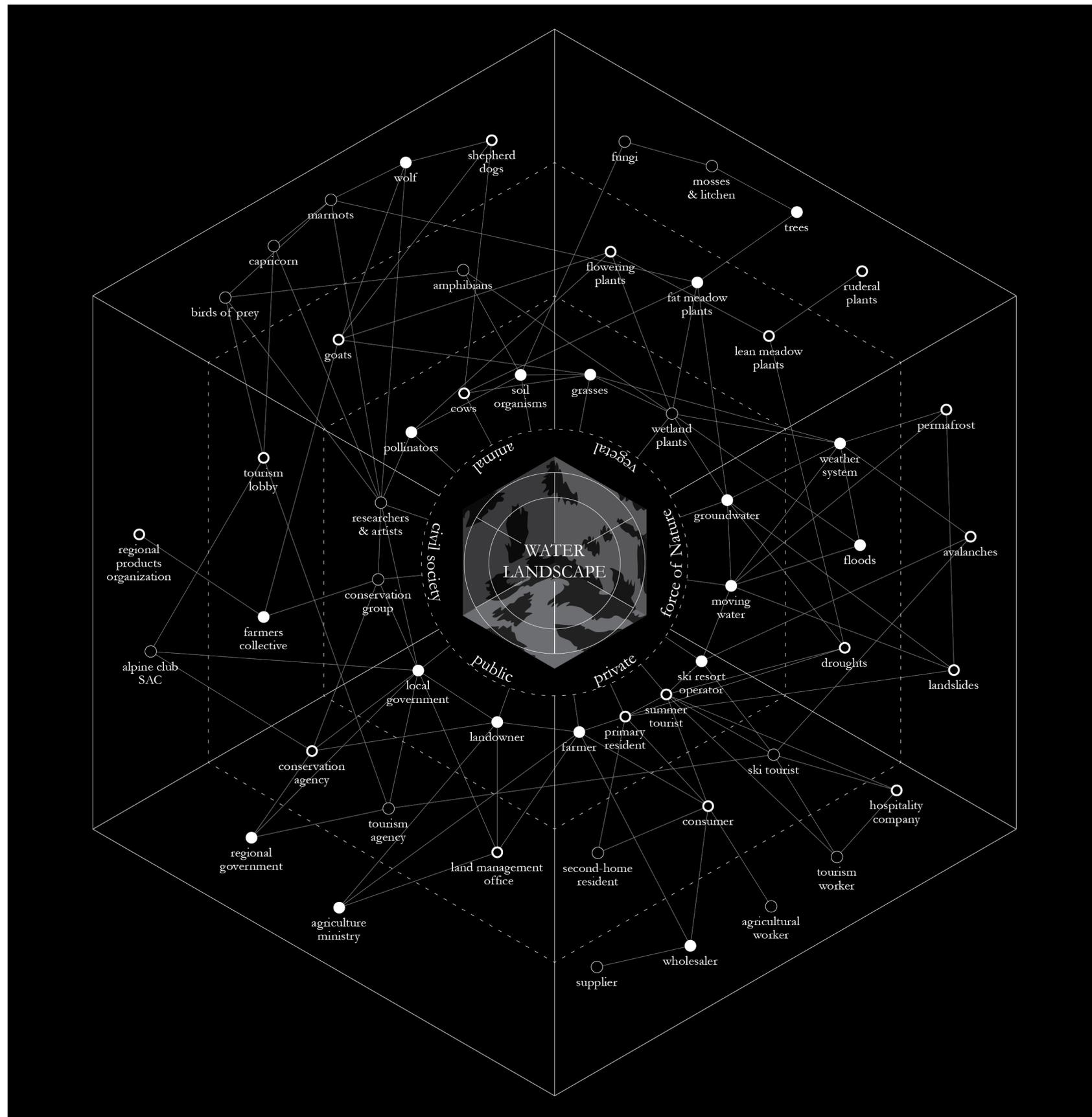
Core Actors

For the design, I selected fifteen actors specifically, who have a close relationship with the concept of the water garden. Each of them will be introduced more closely on the following pages.

Animal Actors
- Cows – Central to both agriculture and ecosystem dynamics
- Pollinators (mostly insects) – Crucial to ecological reproduction
- Soil organisms – Key agents in decomposition and nutrient regeneration;

Vegetal Actors
- Grasses – Rapid responders to fertilization; dominate pasture systems
- Wetland plants – Species adapted to nutrient-poor, waterlogged environments; many are endangered and sensitive to change.

Forces of Nature
- flowing water – Surface hydrological force shaping landforms, providing immediate water access for animals.
- Groundwater – Subsurface hydrological system; slower, larger-scale movement, essential for plant life and nutrient transport.

Private Actors
- Farmers – Primary human caretakers of ecosystems; agricultural heritage.
- Primary residents – Permanent inhabitants, invested in the valley's future.
- Summer tourists – Visitors drawn to the landscape (especially for activities like mountain biking and running); a key source of economic income.
- Ski resort operator – A private company central to winter tourism

Public Actors
- Local government – Regulatory authority and major landowner;
- Other landowners – A diverse group that may include private individuals, public institution, or civil society bodies like alpine cooperatives; treated here as public due to legal frameworks governing land ownership.

Civil Society Actors
- Conservation groups – Engage through projects and political advocac
- Artists and researchers – Knowledge producers, communicators, and advocates for more-than-human perspectives, this includes me.

Figure 69. Core group of 15 human, non-human and more-than-human actors

Actor Characterizations

For each actor, I defined the main aims, problem perceptions, and agency. For non-humans, I translated this to Ways of Life, and Irritations: How the actor likes to live, and what irritates this. It has to be noted that this is mostly intuitive.

Mapping the agency of each actor, I focused on three dimensions of agency: size / number, creative power in the landscape, and institutional power / representation. The third dimension is again compromised for non-humans, as they are not active participants in the current political system, so I used a hybrid of advocacy by ecological groups and scientists, as well as political protections under the law.
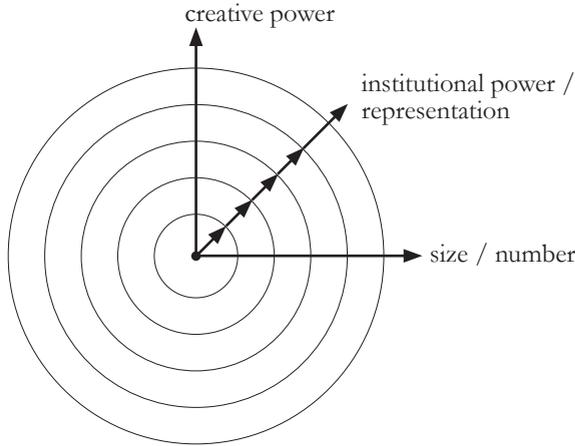
h1. Farmer

Aims
Sustainable agriculture practice, with financial stability, contact with Nature and tradition.

Problem Perception
Marginalization of role in society, low margins, ecological uncertainty and Natural disasters.

Agency
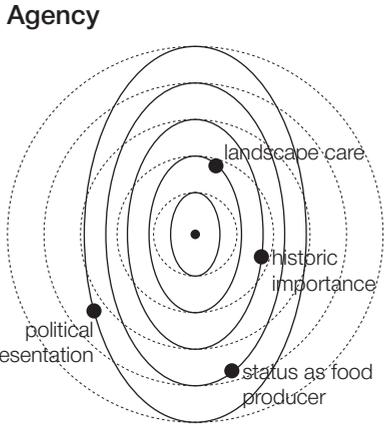
h2. Primary Resident

Livable environment with a sense of community, financial stability, long-term future for families.

Economic hardship, fear of over-tourism and loss of local culture and village life.
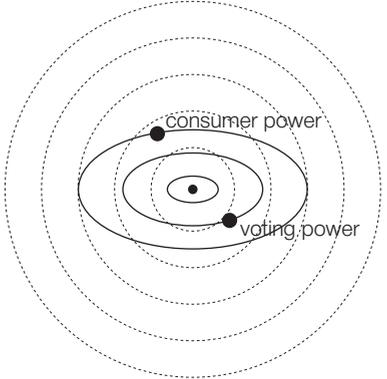
h3. Summer Tourist

Entertainment, sport and recharging, immersion in local culture, sublime Natural environment.

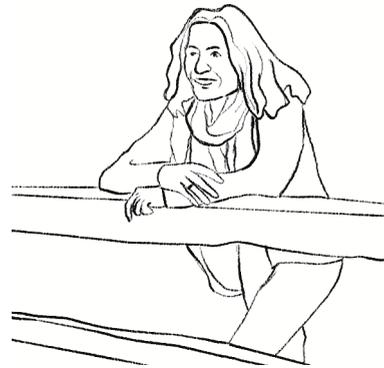Degradation of the environment, too many other tourists.

h4. Ski Resort Operator

h5. Land Owner

h6. Local Government

h7. Conservation Groups
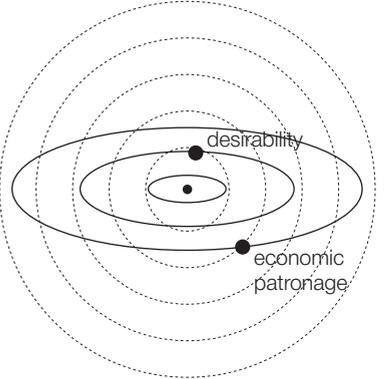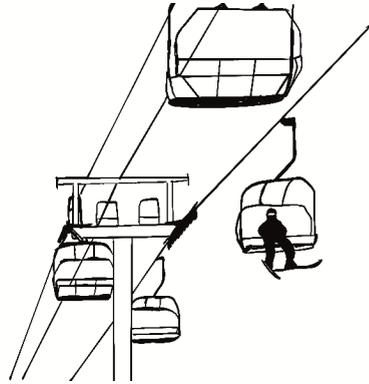
Aims

financial profitability, long-term stability of winter tourism and alternatives throughout the year.

diverse aims, in general usage of the land, rezoning for housing to raise land value.

Providing the residents with services, investments in the municipality, raising quality of life.

Protection and improvement of the Natural environment, advocacy and projects in the Landscape.

Problem Perception

Climate change, snow availability, natural disasters, competition from other destinations.

Sinking land value, under-usage of the land because of depopulation.

Depopulation and loss of economic perspectives, decline in village life, uncertainty in tourism revenues.

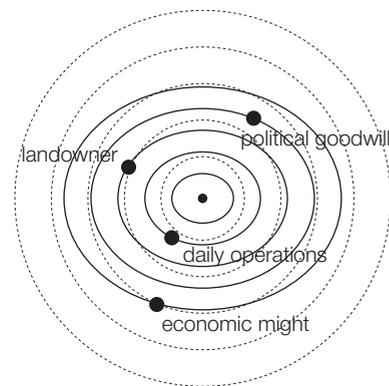Unsustainable farming and tourism, infrastructure development, looser regulations.

Agency

h8. Researwchers & Activists

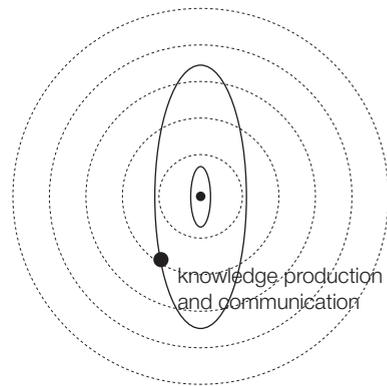**n1.** Cows

n2. Pollinators
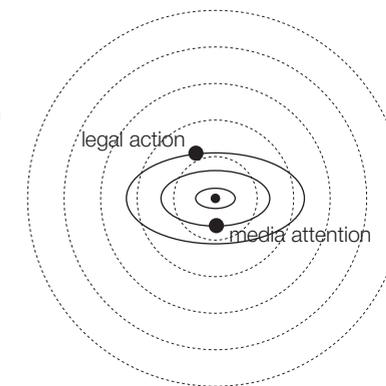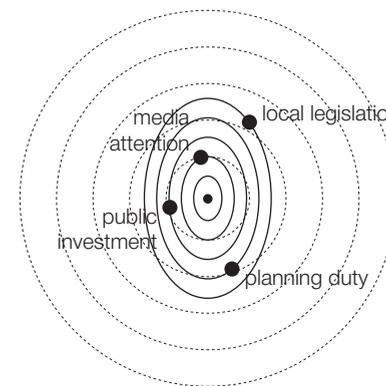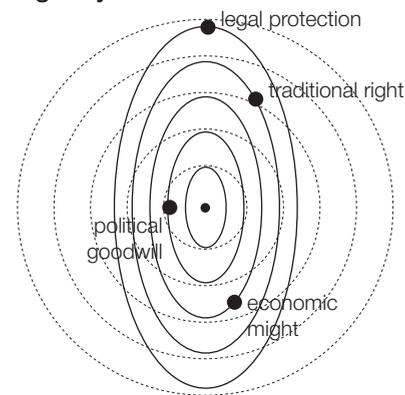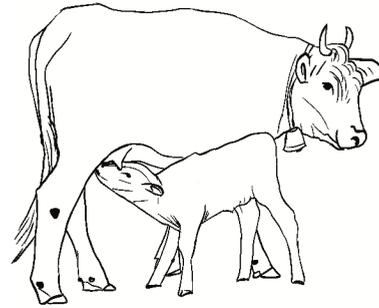
n3. Soil Organisms

Aims
Finding knowledge and possibilities in the socio-ecological environment, communication and application.

Problem Perception
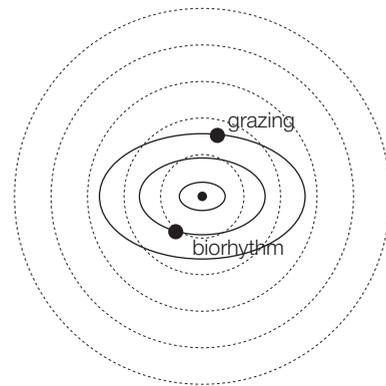Lack of support and funding, disconnect with local communities.

Ways of Life
Having a pleasant life, care for their calves, social connections in the herd.

Irritations
Unhealthy breeding, feeding, and keeping practices, overcrowding in stables, little outside space.
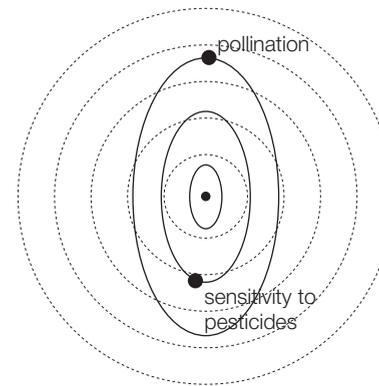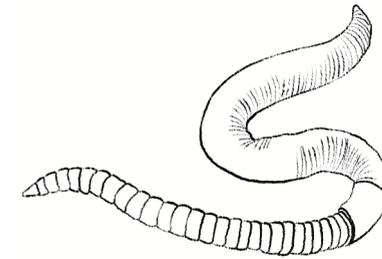
Nectar collection, pollination of flowers.

pesticides, biodiversity decline, changes in weather and temperatures.
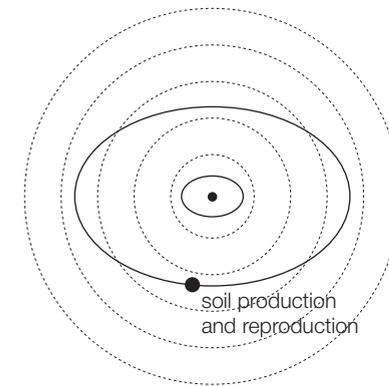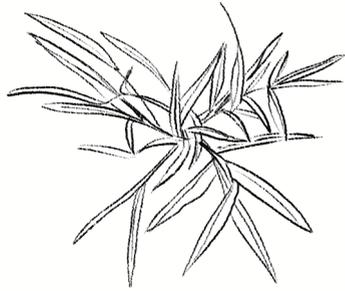
Digestion of dead organic materials, decomposition into basic nutrients.

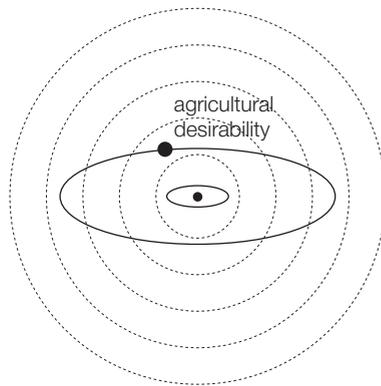Pesticides, soil compaction, heavy metal pollution.

Agency

knowledge production and communication

grazing

biorhythm

pollination

sensitivity to pesticides

soil production and reproduction

n4. Grasses

n5. Wetland Plants

n6. Groundwater

n7. Moving Water

Ways of Life

Fast growth, spreading seeds through wind.

Life in wet soils, specific nutrients availability, constant minimum water level.

Continual flow, fed from rain and cryosphere, provision of water and nutrients

Continual steady, sometimes erratic flows, erosion and carving of landscapes, transport of water

Irritations

Overuse of the land, frequent mowing, water scarcity.

Overuse of fertilizer and runoff from lifestock, droughts, decomposition of peat layer.

Water scarcity, drying out of the soil, anthropogenic infrastructures and foundations

ground, rain, meltwater scarcity, anthropogenic infrastructures and alterations of water courses

agricultural desirability

(some) legal protection

ecosystem services

sustainment of life and transportation of nutrients

land forming power

legal protection
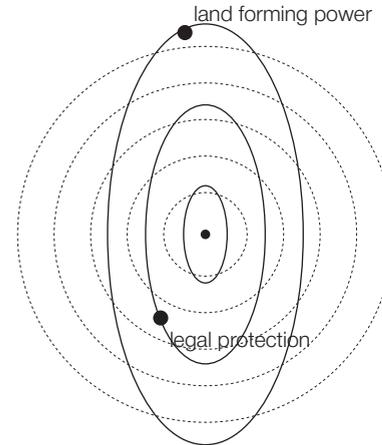
Living Landscapes

Mapping living landscapes is another approach proposed by Aït-Touati, Arènes, and Grégoire in Terra Forma (2022): The task is to draw living things, not the static euclidian landscape, in order to grasp the interactions through which the living landscape is produced: The living landscape model is a way of showing "that space does not exist prior to living things, but is rather made up of the various living things that are present" (Aït-Touati et al., 2022, p. 84). I adapt this model by re-combining it with the Euclidian landscape in form of a conventional map of the local landscape. The idea is to relate the living landscape, such as Aït-Touati et al. see it, with the landscape as it has been measured by the processes of control and power which shape the territory. Neglecting the traditional way of mapping, in my opinion, weakens the step of reconceptualization.

Placing the fifteen actors around the landscape, I let them move into the spaces they inhabit. It becomes apparent, that some spaces are quite crowded – if they are contested, or if there is harmony there, is not apparent in this mapping – yet, just the presence of the actors is noted. But it allows locating the actors in space and relating them to one another. It is clear that each space is co-constructed, by many actors, at the same time. Proposing interventions in those spaces is a matter of co-creation together with those actors.

Figure 70. Living landscape of Lumnezia
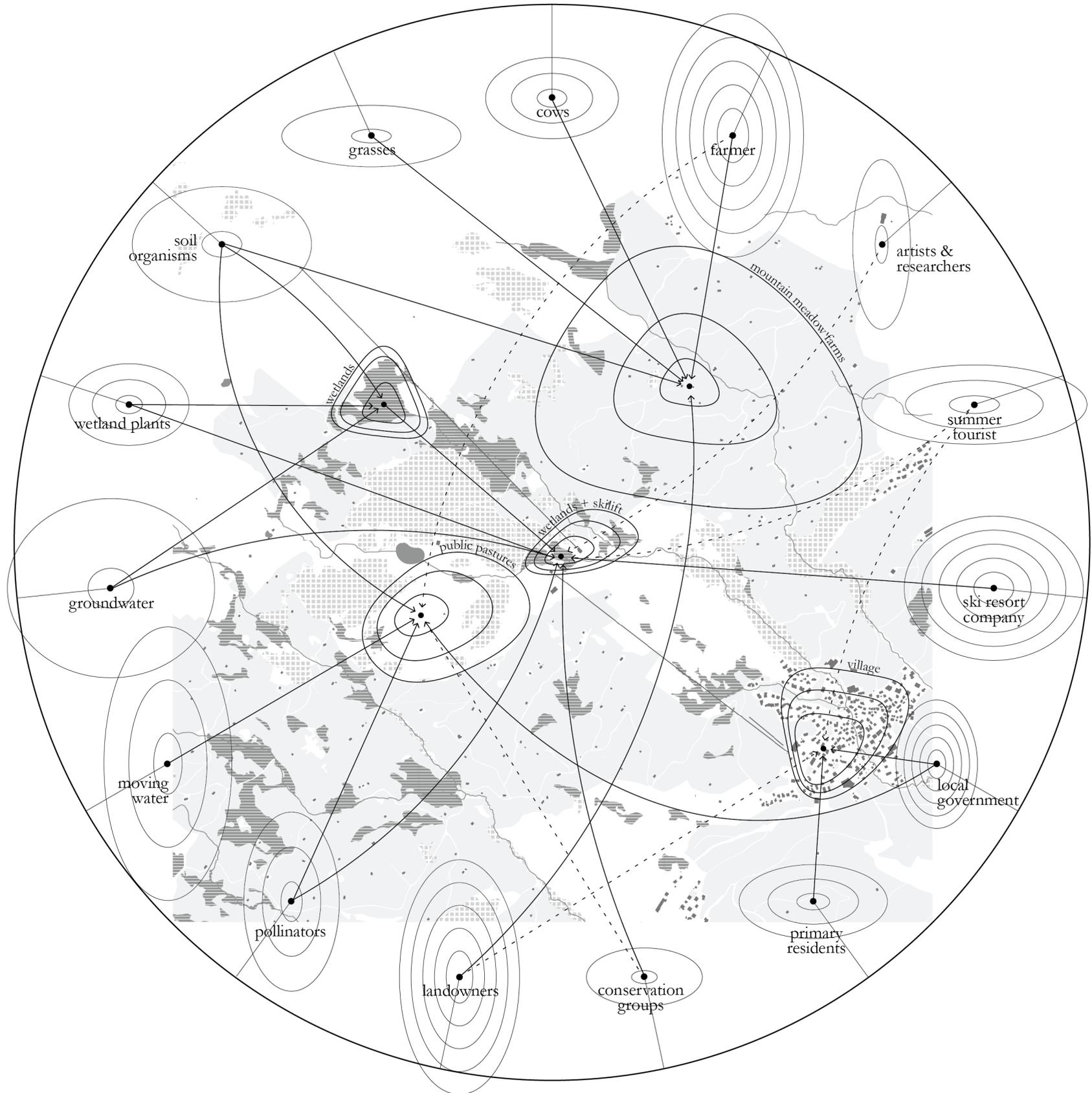
Procedural Perspective: on the Parliament of Things

The practical realization, that the landscape is indeed co-constructed by humans and non-humans calls for an excursion into the parliament of things by Bruno Latour (1993), which provides the theoretical backing and also possibilities to move toward the design and refuturing chapters. Mapping the actors in space uncovered a dense, entangled field of relations. What remains is to clarify how these entanglements might nor only be acknowledged, but actively represented, negotiated, and worked with through design.

Latour's Parliament of Things introduces a conceptual space where nonhumans are granted a form of representation. In contrast to the modern divide that separates nature from society, Latour proposes a political ecology grounded in the recognition that non-humans, including landscapes and materials, are not passive backgrounds, but active participants in shaping collective life. The Parliament is not a literal institution, but a metaphorical and methodological framework: one that invites us to reconsider how decisions are made, by whom, and in the name of what entities.

This idea is closely linked to the foundations of Actor-Network Theory (ANT), which underpins much of Latour's work (Latour, 2005). ANT suggests that agency is not a property of individual subjects, but a result of relations between heterogeneous actors. In this view, a place is not merely a physical setting but an emergent effect of interactions, negotiations, and translations among actors. The Alps, the valley of Lumnezia, and a single wetland are not fixed environments but ongoing assemblages of processes, each shaped and reshaped by its actors.

In this context, the question becomes: who and what gets represented in design? Traditionally, only human stakeholders—residents, policymakers, landowners—are invited to the table. But in a Parliament of Things, nonhumans are understood as stakeholders with interests as well. These actors may not speak, but their interests manifest through changes in their lifeworlds. They require translation and representation, possibly through data, indicators, models, or storytelling. The positionality of the designer, discussed earlier in this thesis, is worth briefly reiterating here. In such a framework, the designer is not a neutral problem-solver, but a mediator and facilitator—someone who proposes forms of cohabitation that recognize entanglement.

Crucially, the Parliament of Things is not just an ethical lens—it can directly inform design decisions. It prompts the designer to consider: which actors are affected? What forces are at play? How might a given intervention change the field of relations? For instance, the placement of a path might avoid a sensitive habitat, or a wetland restoration might be shaped in dialogue with grazing rhythms and groundwater dynamics. Design, in this sense, becomes a proposal made within a dynamic assembly—not a top-down imposition, but an act of careful alignment. The Parliament of Things offers a way to think through these decisions systematically, with an eye to shared futures, distributed agency, and responsible transformation.

While this chapter attempts to clarify and spatialize the entangled relations of the landscape through mappings and conceptual frameworks, it is important to acknowledge the caveats raised by theorists like John Law and Alfred North Whitehead. In After Method (2004), Law argues that the world is not coherent, stable, or neatly ordered—and that our methods, if they are to remain truthful, must embrace this messiness. According to Law, Method is not a "set of procedures for reporting on a given reality. Rather it is performative. It helps to produce realities." (Law, 2004, p. 143) In this light, the diagrams and maps I made are not neutral tools, but interventions—they shape attention, prioritize certain relations, and inevitably exclude others.

Intermezzo

Manifesto: What's at Stake

Concluding part II, I have established the landscape as a living system of entangled actors and practices. It is in essence co-constructed, physically through practices of care and maintenance, and imaginary through interpretations and affectations. The alpine landscape of the Lumnezia valley and Pez Mundaun are especially in flux through the pressures and urgencies outlined in Part I.

Chapter 3 I explored four minor ways of interpreting the landscape, through the lenses of geology, wetlands, landscape care, and names and identities. This has opened up the viewpoint of the land-scape as a multi-faceted, multi-layered space in flux. Chapter 4, in turn, has traced modes of co-construction, by establishing the systems at play across seasonalities and scales. The actors which move the systems along show the relationality in the landscape.

The subquestions 2 and 3 of the research question have been, in essence, the impetus for these two chapters: What are the plain and hidden processes of (de)futuring and (de)territorialization of the Alpine territory and the Lumnezia valley? And which actors and processes co-construct the water culture landscape? While I will elaborate on these questions more in the Coda, some first attempts at an answer can also help form the next part.

The plain processes of defuturing in the Lumnezia valley reflect broader transformations across the Alps: the changes in climates and thus cryosphere and hydrosphere, the intensification of agriculture and consolidation of farmland, and development of tourism infrastructure. Hidden processes are also at work: the loss of place names, of ecological diversity, et cetera, many of the same processes also contribute to deterritorialization.

Answering question 3 is quite straightforward: For the purposes of the next part, it is 15 human and non-human actors. Of course, there are many more at work, which problematizes the phrasing of the question: There is not a definitive set of actors and processes, but it is clear that a network emerges, constituting the water culture landscape, and it is rather a question of how to handle the com-plexity and messiness of real life in the design process.

Figure 71. Undulating meadow
landscape at Paliu Nera, Lumnezia

Goals for Refuturing

After the two Parts Locating the Self and (un)learning, the third step is walking-with. Refuturing the Alpine space, and particularly the Lumnezia valley, can be done through design so long as it is embedded in the space and actively engages with the actors and processes forming the network of life and landscape. If this is not the case, and design is too narrow and simplified, it will not contribute to the sustainment of the territory.

Design needs to be multi-actor, multi-scalar, multi-temporal, multi-modal. The question becomes, if design should not be a cultural practice, the culture landscape as design action is an important proposition for refuturing the Alpine space. At the same time, cultures don't have goals, while design aims to approach some urgency and propose possibilities. Giving direction to design action, three goals for refuturing inform the coming Part III, the design of the water garden and the framework for refuturing.

Designing for sustainment as part of the culture landscape can be broken down into the three goals of design for hydro-ecological sustainment, design for multispecies care, and design for regenerative economies. These three goals are different faces of the same desire for refuturing, and are thus only in name separate from each other. This ambiguity and fuzziness is an important step in relational conceptualizations of design, after all. Here I will explore each of the three goals a bit further, aiming to find ten design measures to take to the design chapter.

Figure 72. Goals for Refuturing

**Design for
Hydro-Ecological Sustainment**

**Design for
Multispecies Care**

**Design for
Regenerative Economies**

Design for Hydro-Ecological Sustainment

Sustainment according to Tony Fry (2003) is the capacity of the planet to sustain life long-term, without long-term degradations hidden beneath short-term sustainability and resilience. The hydro-ecosphere of the Alps and the valley are the base of life and need to be protected and rehabilitated, underpinning every design step with the concern for sustainment. The water cycle needs to be considered in its entirety, not just as a narrow slice in system boundaries. The same goes with the ecosystem, which extends beyond any boundary within the critical zone of Earth.

Figure 73. Design for hydrological resilience as a goal for refuturing

Design for Multispecies Care

Almost everything we do is related to care, according to Joanne Tronto (1991) and Maria Puig de la Bellacasa (2017). Understanding design as a care action, to support other care actions, aims to undo some of the harm done in the Alps and to the future. Care for, from, with, and by multiple species is the basis of life - an alternative view onto the previous goal. Care is an action, perfomed in a distinct space and time, which design can accomodate.

Figure 74. Design for multispecies care
as a goal for refuturing

Design for Regenerative Economics

Leaving extractive economics behind is just the first step to true viability of the Alpine space in relation to the more industrialized lowlands. The economic diversity and regenerative capacity can be greatly expanded apart from tourism and rationalized agriculture. Economics as the field of human endeavor dealing with exchange of value remains a critical part of any refuturing effort, but these dealings can happen in many different ways. Designing these ways is the third goal for refuturing underpinnin the design measures and actions described forthcoming and in the next two chapters.

Figure 75. Design for regenerative economics as a goal for refuturing
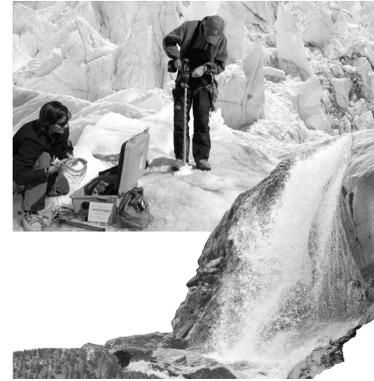
Design for
Hydro-Ecological Sustainment

Design for
Multispecies Care

Design for
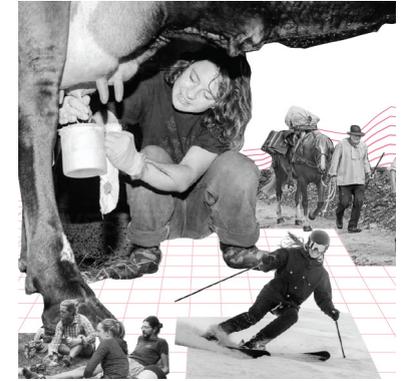**Economic Regeneration**

Design Measures for Refuturing

The design goals as three faces of the same desire for refuturing are still far removed from concrete action. At the same time, this point in the thesis has not yet established concrete understandings of the site and plausible interventions to propose concrete design geometries. So I define an intermediate step, which guide the hand of the designers: These measures here are not defining the shape of the design, but they tell how to hold the pencil to draw them.

The ten design measures here all conected with each goal, I highlighted the closest connections with the colors used.

m1. restore and expand wetlands

m3. grow small and large ecological corridors
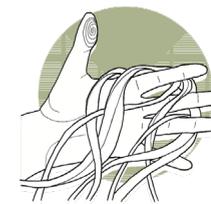
m5. design garden transition zones

m7. create places for community and exchange

m9. common seasonal land uses

m2. restore and protect flowing water

m4. protect niche habitats and sanctuaries

m6. encourage physical encounter
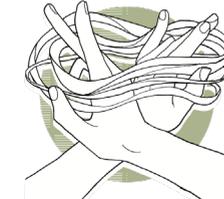
m8. narrate and listen to the landscape

m10. develop soft and adaptive interventions

Design measures in detail

Each measure responds to one or multiple design goals, and is dependent on the agency of many actors. Mapping the depenencies out here allows the design chapter to call upon specific actors through the measures. The same actors also connect measures together. At the same time the measures are not equal in how fast or slow they may be implemented, some are truly generational in scope.

closest association with design goals

● design for hydro-ecological sustainment

● design for multispecies care

● design for regenerative economics

non-human actors

n1 cows
n2 pollinators
n3 soil organisms
n4 grasses
n5 wetland plants
n6 groundwater
n7 flowing water

human actors

h1 farmer
h2 primary residents
h3 summer tourists
h4 ski resort company
h5 landowners
h6 municipality
h7 conservation groups
h8 artists & researchers

associated actors and timescales

quick
decide
build
maintain
use
slow
generational
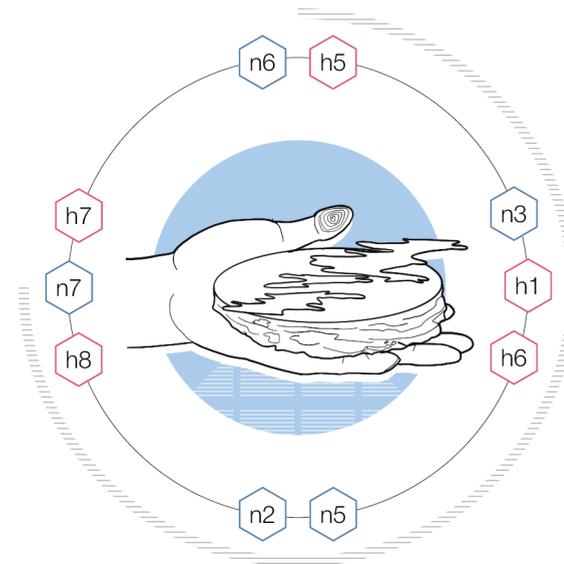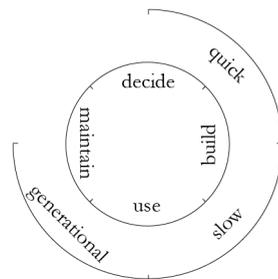
m1. restore and expand wetlands

Restoring wetlands is a multi-generational project measured in decades. The basic premise is to ensure soil remaining constantly under the groundwater level while protecting the substratum and flora on the surface.
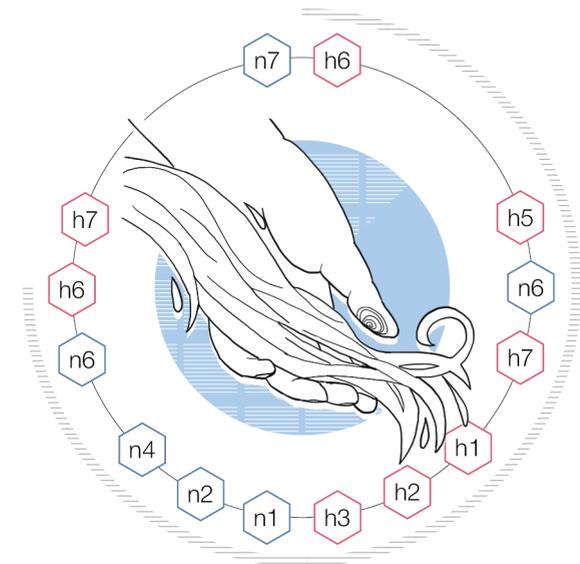
m2. restore and protect flowing water

Streams are biodiversity hotspots and crucial for the movement of water and species in the landscape. Giving space and encouraging meandering strengthens this ecosystem.
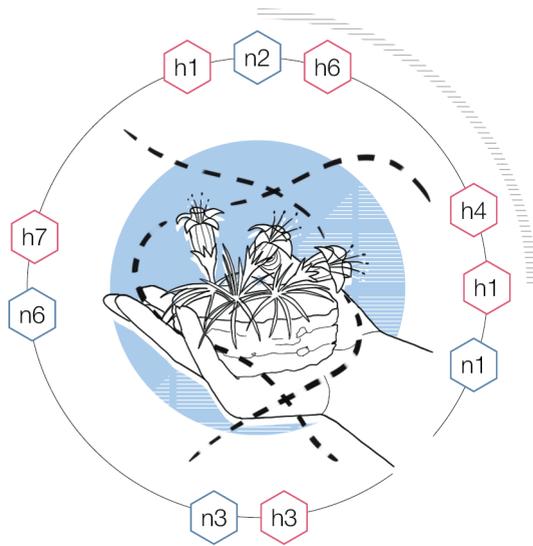
m3. grow small and large ecological corridors

Habitats need to be connected for healthy populations. Large corridors for mammals, as well as small corridors for insects and strengthens both fauna and flora.
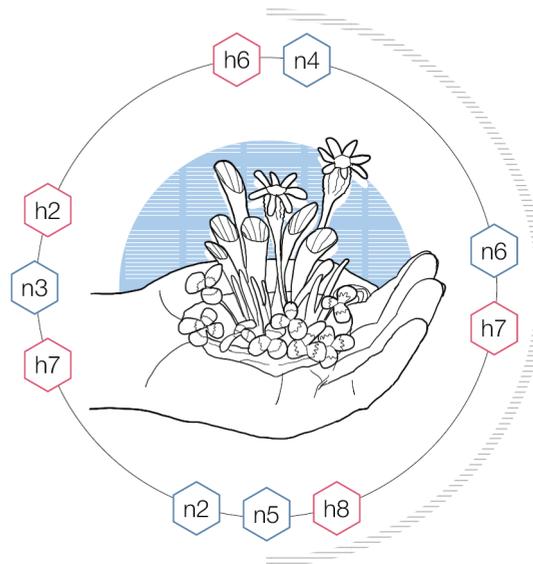
m4. protect niche habitats and sanctuaries

Some species are highly dependent on specific conditions and sensitive to disturbance. Protecting some spaces and leaving them untouched can create sanctuaries for vulnerable species.
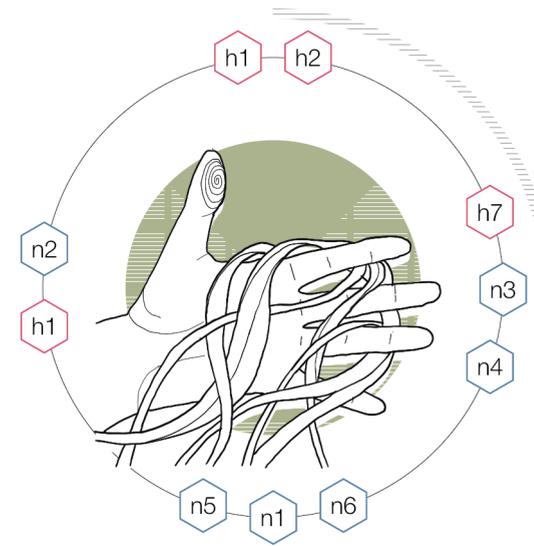
m5. design garden transition zones

Edge conditions are places of interactions, touch, and vibrancy. Edges of the garden need special attention to encourage benefits, while seaparating potential harms such as human access or fertilizer incursion.
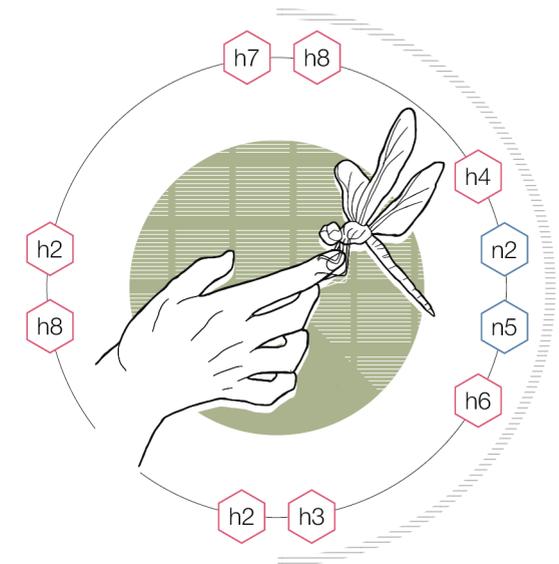
m6. encourage physical encounter

Noticing others happens best through encounter. The stage needs to be set for humans to encounter non-humans with mutual consent. This means not just ensuring sightlines, but providing cover if needed.
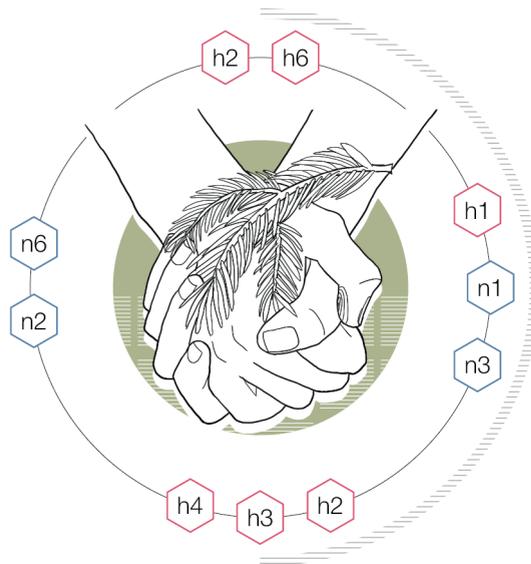
m7. create places for community and exchange

Central places help individuals to find each other and to strengthen their relations. Meeting points should be able to host both humans and non-humans and allow for a certain level of disturbance to their environment.
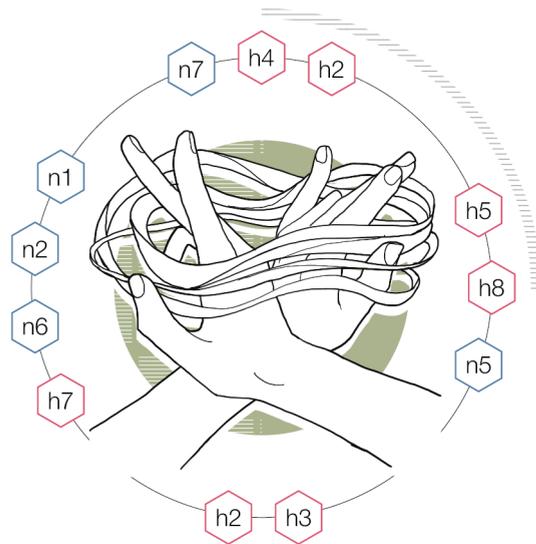
m8. narrate and listen to the landscape

Noticing the form of the landscape can be encouraged by guiding the gaze of humans. This can be interventions to highlight a position, or places to facilitate listening to the non-human and Natural processes at work.
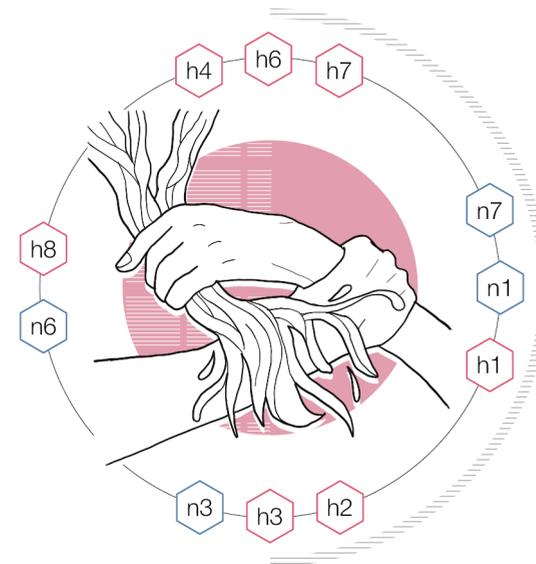
m9. common seasonal land uses

The landscape has many faces throughout the seasons, there are many lans uses throughout the year. Commoning the land for all seasons helps reduce harm and encourage cooperation.
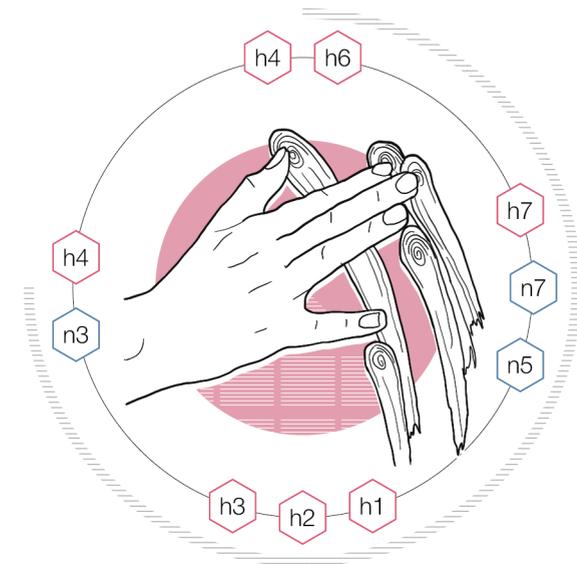
m10. develop soft and adaptive infrastructure

Technical infrastructure provide valuable benefits to human and non-human life. They need to be implemented responsibly and with minimal harm. Responding to uncertainties, changes need to be possible.

Approaching the Water Garden

The design goals and measures outlined here need to intersect with a specific site to become real. At this moment they are not situated, they are just possible ways of designing. All of these measures depend on a multiplicity of human and non-human actors to reach decisions, to design, build, use, and maintain them over time. They are a way of shaping the existing co-constructive practices of the culture landscape toward the ultimate goal of refuturing, so they are not part of the existing culture but an intentional step within this cultural fabric that surrounds them. In space they become physical, through an intentional measure to introduce water to the culture landscape.

The Water Garden aims to do just that. It is not just a physical design, it is an emergent property of the co-constructed landscape. To this aim, the culture landscape needs to be interwoven with a design culture that embraces the agency of water, and the agency of the other non-human actors who are entangled with water and humans. This water culture has a different set of values at its core than the culture of capitalism and consumption which is currently defuturing and deterritorializing the Alps. While it is not guaranteed a culture forming around the Water garden has alternative modes of negotiating life, territories, and futures.

The Water Garden goes beyond semiotics, though. It offers a design for the future, but it also opens a space for experimenting, experience, noticing, and touching, more-than-human futures. And it is not just a symbol or a space to negotiate futures, it also is a proposition to actually use the human agency under the Anthropocene to reach out to others, and to do things differently – as individuals, communities, and societies.

*"I think of **walking with** as a form of solidarity built on reciprocity and mutuality, walking and listening, talking and doing. **Walking with** entails engagement with Indigenous communities and individuals as intellectual and political subjects, colleagues in the practices of producing worlds."*
(Sundberg, 2014, p. 41)

Walking—With

Part III

Chapter 5
Design: The Water Garden

Let us briefly return to the problem statement: Anthropogenic climate change, biodiversity loss, increasing uncertainty in the water cycle, and the resulting socio-ecological and economic defuturing of the Alpine space are large, trans-scalar challenges. Their effects are local - experienced in farms, wetlands, and villages - but also inseparable from regional and global systems (Traversa, 2025). Addressing them requires both local action and broader coordination. If Alpine communities are to sustain their lifeworlds, situated efforts must be made to open pathways of refuturing.

Design, in this context, must be both imaginative and grounded: capable of engaging systemic scales while remaining practical and actionable for small communities. It must operate across long temporal spans - years, decades, even generations. More than a single intervention, such a design becomes a practice or programme, adapting to ecological timeframes and intergenerational stewardship. As Alpine farmers put it: *"Gib den Hof so an deinen Sohn weiter, wie du ihn vom Vater erhalten hast"*—"Pass the farm on to your son as you received it from your father" (Kaufmann, 2020). This ethos of continuity and care offers a model for long-term landscape engagement.

Respecting the agency of non-humans in the making of landscape is both a traditional practice and contemporary proposition for designing futures. Many Alpine communities already understand Nature not as a backdrop or a resource, but as a partner (Chapman & Deplazes-Zemp, 2024). This relational perspective is rooted in a history of land-based knowledge and care - at once deeply local and structurally entangled with global systems.

Reading the landscape in Lumnezia reveals this nested complexity: the village of Vella connects to the valley, to Surselva, to the canton of Grisons, to the Swiss Confederation, and to the Alps and Europe beyond. This region has a history of resisting external control - not only through rebellion such as in the 15th century (Cabalzar, 2024), but more recently in the 2016 rejection of the Adula nature park proposal (Stettin, 2017). These gestures reflect not just rural suspicion but also a defense of local agency against historic marginalization (Chand & Leimgruber, 2016).

It is within this cultural, ecological, and political context that the Water Garden is proposed.

Introducing the Water Garden

The Water Garden is introduced here as a response to the challenges outlined before: a territorial project grounded in landscape care, hydro-socio-ecological functions, and adaptive futures. Rather than a fixed masterplan, it is a proposition - an evolving collection of infrastructural interventions, maintenance practices, and more-than-human cooperation. It aims to enhance water retention in wetlands, support biodiversity, sustain agricultural practices, and cultivate cultural and ecological sustaniment in the Alpine space.

The Water Garden unfolds through layers: soil, care, culture, and governance interweave to shape a living, co-produced landscape. At its foundation lies the soil - a porous medium for exchange between roots, organisms, nutrients, and water. Above it, the garden takes form as a vertical and horizontal assemblage of functions and meanings: localised practices of affection and maintenance, ecological feedbacks, and social relationships.

The concept operates across scales, from individual wetlands to landscape mosaics and regional networks. It is defined by emergence: the situated, adaptive formation of space over time through human and more-than-human interaction. The spatial articulation of these nested scales is illustrated in Figure 76, which locates the Water Garden in relation the local, regional, and Alpine territory as well as the systemic section of the hydrosphere.

The Water Garden resists single authorship or linear delivery. It is instead a living framework for co-habitation and co-survival - one that integrates ecological processes with community practices and institutional structures. In doing so, it seeks not only to respond to environmental pressures but to generate new capacities for living with water in the Alpine landscape.

Figure 76. The Water garden in the Alps, regional and local scale, and systemic section
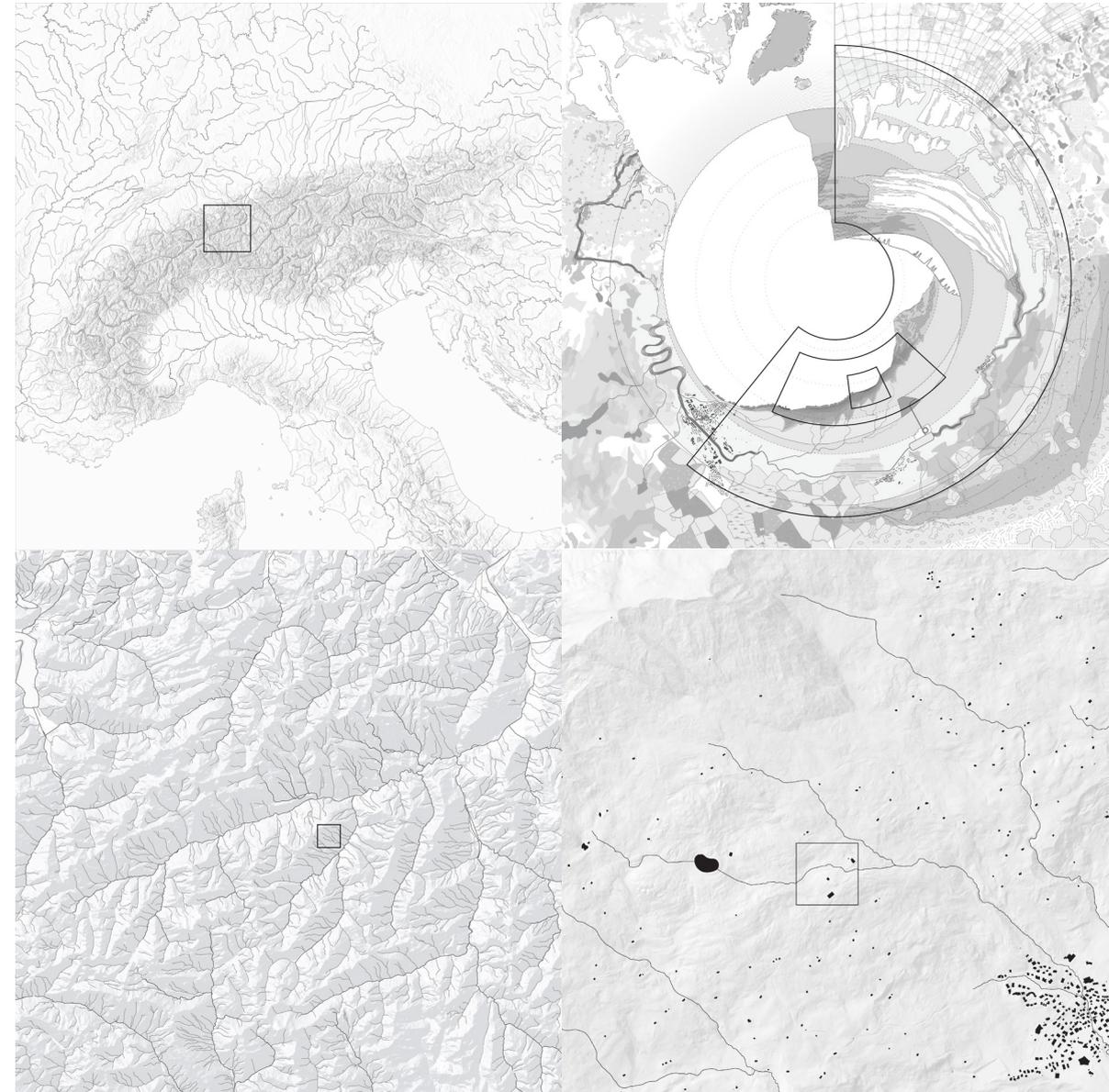
the WATER GARDEN
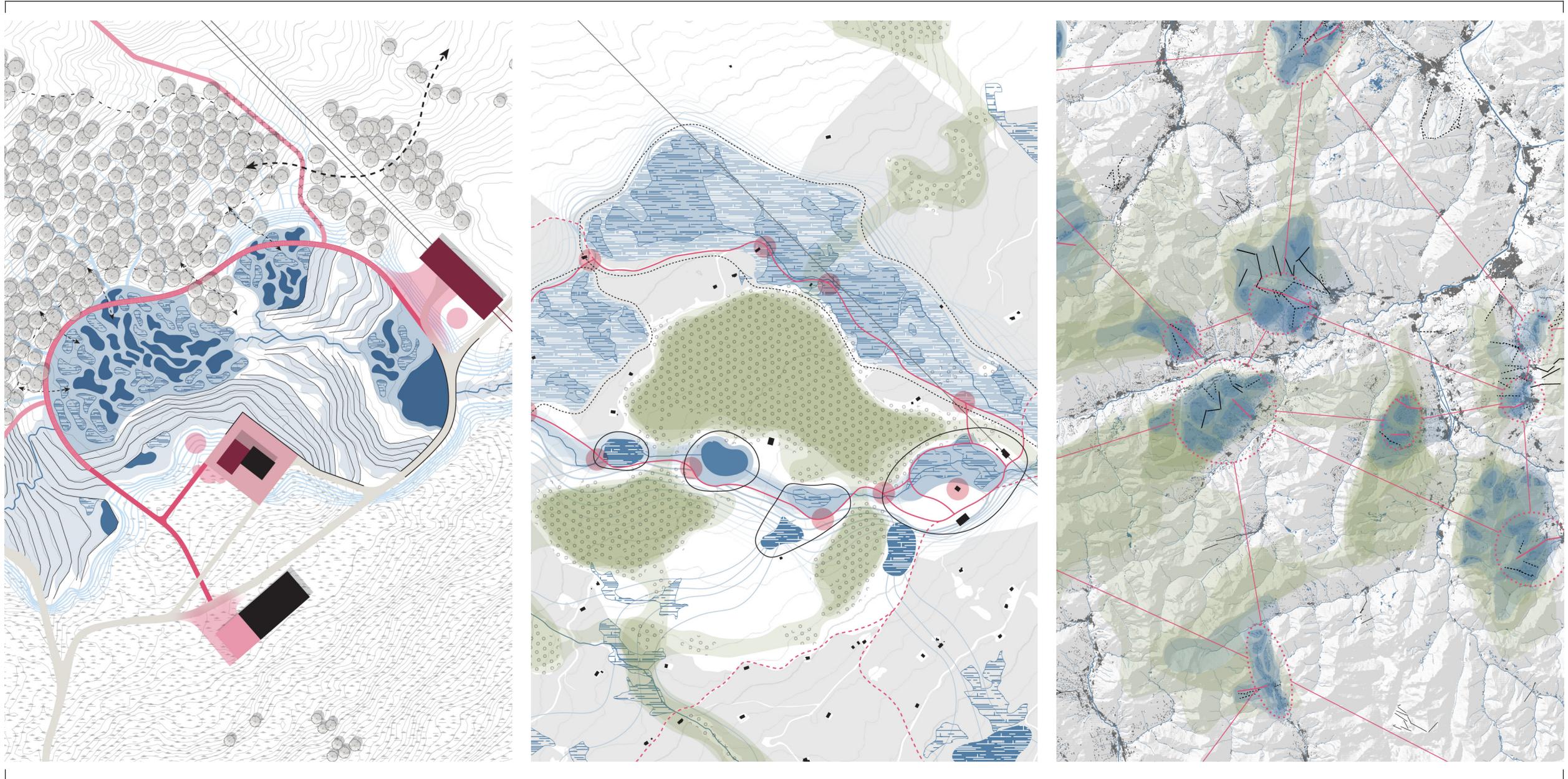
a PROPOSITION for REFUTURING

Why a garden?

Gardens are not just a space for plants, but complex cultural, ecological and spatial constructs. They are expressions of cultural values and beliefs, and encode history, tradition, and ethics. Throughout the history of gardens, they reflect the changing conceptualization of Nature-human relationships: the French formal garden as an expression of rationalism and control, and mathematics as the ultimate form of Nature. English landscape gardens as curated wilderness to reflect freedom, taste, and moral purity. Japanese Zen gardens of simplicity, impermanence and minimalism. Persian chahar bagh as a reflection of divine order within geometry. Botanical gardens as a showcase of imperial knowledge, colonial power, and scientific classification. Permaculture gardens to foster resilience, interdependence and ethical care. Or the garden of Eden as a primordial space of innocence and a reminder of human sin.

The most basic principle of a garden is its border: every garden has one to define where it is, where civilization ends and wilderness begins. This border may be a fence or wall, a path, or even just a line on the map – its consequence is not to limit what is inside and outside, but to limit what humans see. Of course, nature doesn't stop at the border of a garden, weather, water, pollen, pollinators, birds, animals, plants and more are known to cross any human border.

There is one border, which for practical reasons may limit the diffusion of Nature: the planet. The Earth can be seen as a finite, shared garden, one which Gilles Clément called the planetary garden (le Jardin planétaire), which is occupied "by more or less good and responsible gardeners (humanity)" (Clément, n.d.). The planetary garden is a concept that recognizes the global interdepenedence of ecosystems, the ethical responsibility of humans toward Nature, and the shared nature of the natural environment (Clément, 2015, 2021), shared between all humans and – crucially, all others. On a practical note the concept reinforces the interdependence of the water garden as an open system, which is the first reason why I chose the term garden.

Gardens are flexible concepts, really anything can be a garden. Regional Nature Parks are areas of foremost Nature and Landscape protection areas, as per Swiss law. Such a park has a clearly defined border and programme – and thus qualifies as a garden in the widest sense. Nature parks however not exclusively spaces for nature, all sorts of uses happen there: fostering biodiversity, providing quiet zones for sensitive species, but also sustainable agriculture, tourism and local production (Regionale Naturpärke, n.d.). A successful example is the UNESCO biosphere Entlebuch in Switzerland, which has a strong focus on the sustainment of local ecosystems, but also successfully fits in the needs and agencies of the local communities (Biosphäre Entlebuch, n.d.). Such a garden is really a space where everything which happens in the landscape can still happen, just with a different focus, ethics and politics. If a single family house stands in the middle of the garden, is it not part of the garden? These considerations form the second reason for the concept of a garden for my design.

Like Gilles Clément observed, and regional nature parks and the UNESCO biosphere Entlebuch are actively implementing, gardens are hybrid spaces. "The gardener discovers something new in their garden every day. They are in constant dialogue with all of diversity." (Clément, 2021) "A balance between use and protection - a region where people and nature are equally at home and have a positive influence on each other." (Biosphäre Entlebuch, n.d.). Their hybridity seems to make gardens ideal spaces to manifest natureculture: A petri dish that you smear with a sample of humans in partnership with Nature, to observe what may grow in it. The agar of the garden is the soil and a shovel, the ability to start shaping this Nature-human relationship. The rich conceptual possibilities and real simplicity of the idea is the third reason for the Water garden.

The Anthropocene reminds us that for better or worse, humans are inevitably altering the world. The agency of humanity over planet Earth is not expected to weaken any time soon. It is thus not (just) a matter of giving Nature back control, but to find a different way of coexistence with Nature. This forms the final reason I chose a garden as the conduit for my design. It is an acknowledgment of humanity's agency, but wilful choice to reach out to Nature.
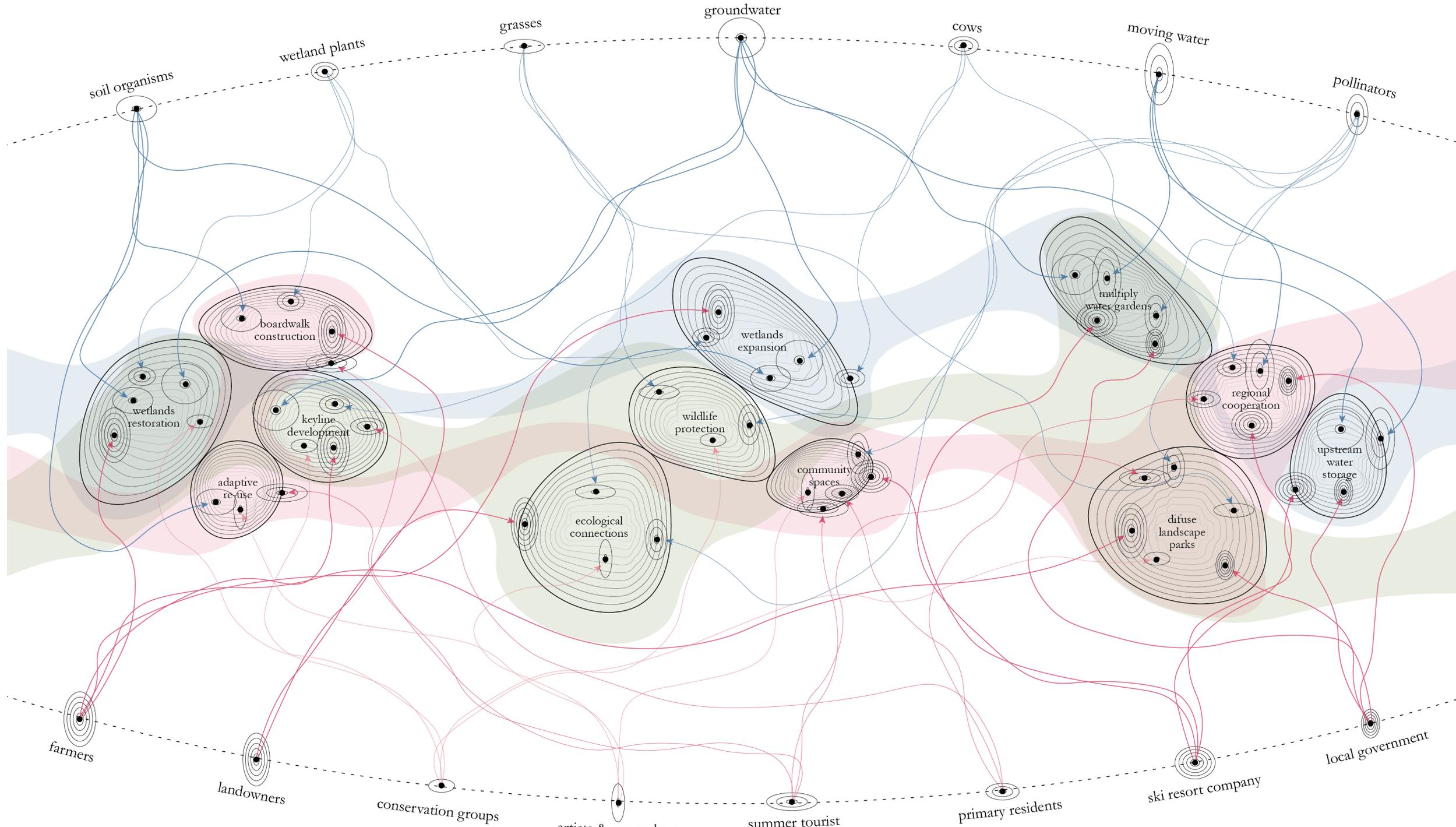
Figure 77. The Water Garden emerges
through entanglements and co-constructive
actions of human and non-human actors
over time, to achieve the goals of refuturing.

groundwater

grasses

cows

moving water

wetland plants

soil organisms

pollinators

multiply
water gardens

boardwalk
construction

wetlands
expansion

regional
cooperation

wetlands
restoration

keyline
development

wildlife
protection

upstream
water
storage

adaptive
re-use

community
spaces

ecological
connections

difuse
landscape
parks

farmers

landowners

conservation groups

artists & researchers

summer tourist

primary residents

ski resort company

local government

actor agency

intervention

action

strong action

goal: hydro-ecological sustainment

goal: multispecies care

goal: regenerative economics

Emergence

In this chapter, I introduce the Water Garden not as a finished design, but as an emergent landscape - one that forms over time through the entangled actions of human and more-than-human actors, institutional systems, informal practices, engineering processes, and ecological dynamics. Rather than being implemented through a linear, top-down plan, the Water Garden is co-produced. It unfolds through distributed actions and responses, intentional and autonomous, across multiple spatial and temporal scales.

To explore this, I look at emergence through three nested scales of landscape: At the body–wetlands scale, emergence is intimate and immediate. It is shaped by situated actions such as excavating keylines, managing wetland vegetation, and adapting grazing patterns - labour that is often repetitive and weather-dependent, yet ecologically consequential.

At the local–landscape scale, emergence takes the form of systemic interrelations. Paths, wetlands, pastures, and forest edges co-evolve in response to ecological gradients and human uses. These spaces are not simply composed, but composed-with - negotiated through shifting affordances, environmental conditions, and temporal rhythms.

At the regional–archipelago scale, emergence becomes a patterned multiplicity. Here, practices and concepts translate across locations, generating variation, cultural resonance, and ecological impact. Horizontal exchanges among actors give rise to adaptive knowledge, solidarities, and evolving modes of governance, both formal and informal.

Across all these scales, emergence reframes design from a mode of delivery to one of co-survival and habitation. The Water Garden is not an object, but a process - an ecology of shared labor, care, and interdependence. This chapter maps these dynamics, revealing how emergence becomes both a design principle and an ontological condition. Rather than a singular vision imposed on the landscape, the Water Garden unfolds through a polyphonic process of relational construction.

This sets the ground for the final chapter 6, Refuturing, where I propose a framework for adaptive futures rooted in these practices. There, emergence becomes not only descriptive but generative—a means of imagining territorial transition through more-than-human commons, ontologies of care, and alternative modes of exchange.

co-constructed intervention

low relevant actor

actor agency

high relevant actor

non-human actors

body scale

local scale

regional scale

human actors
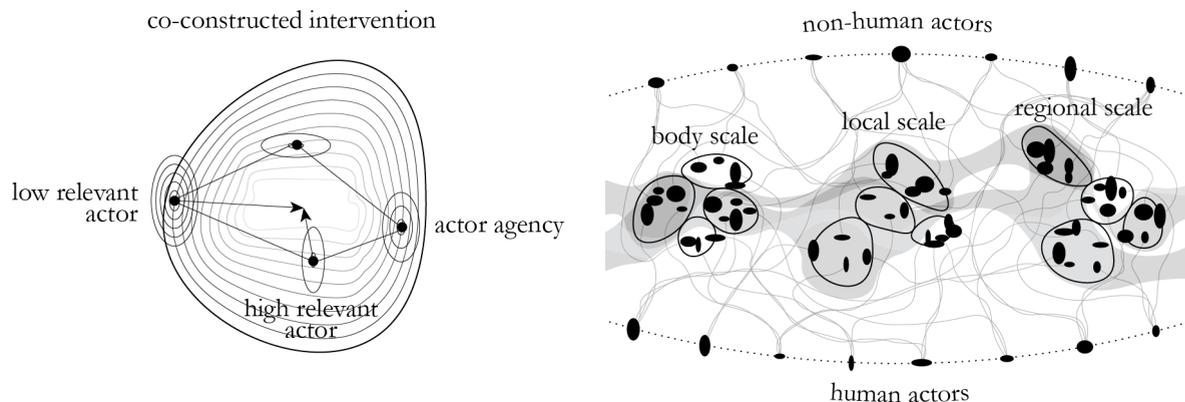
Interventions and Practices of Care
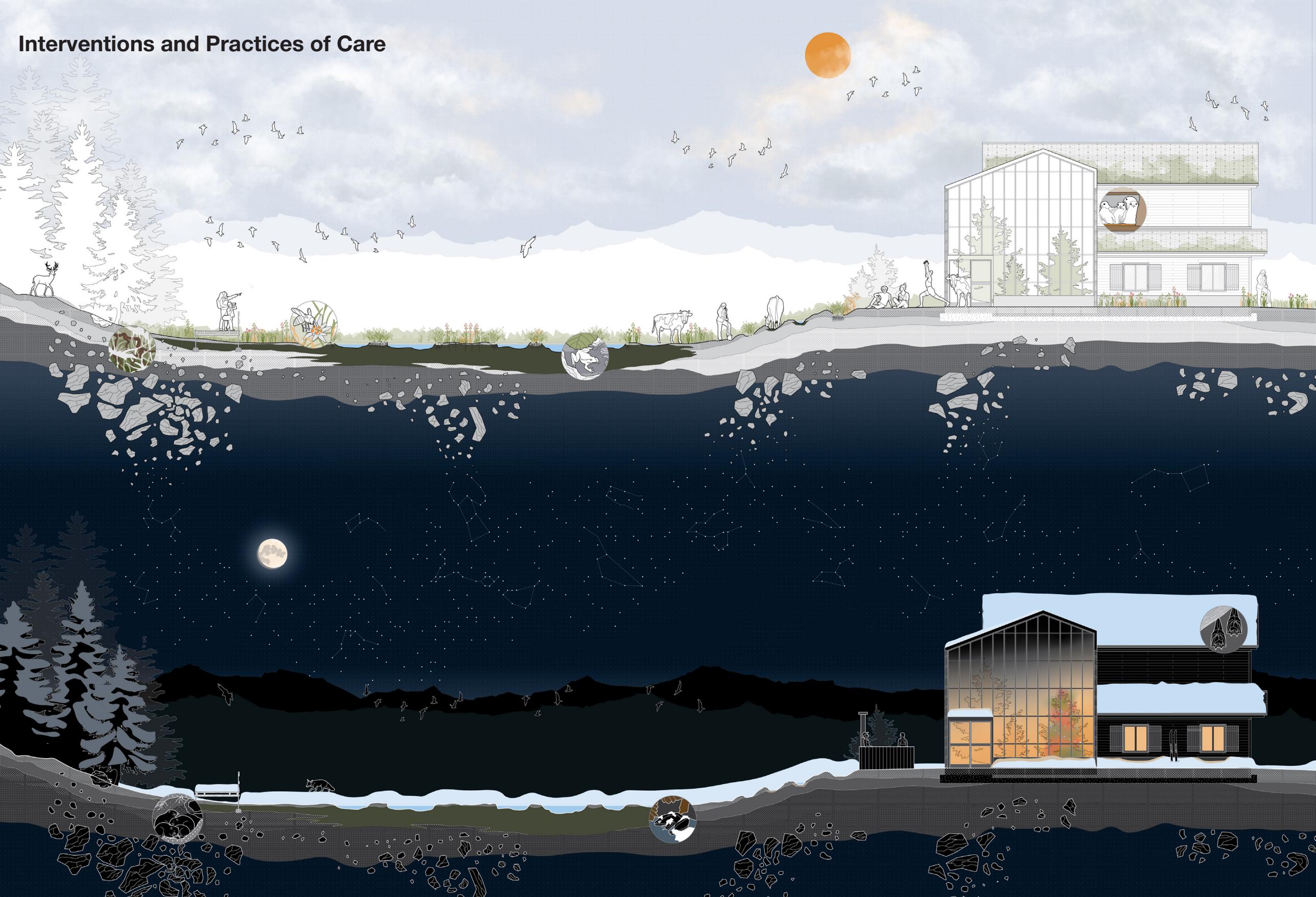
Intervention
Boardwalk

Framing the wetlands, providing and regulating access to the landscape, while ensuring geo-hydrological connection actoss this border. The boardwalk is a light-weight construction, pre-manufactured by local carpenters, and transported to the site by ski lift.

summer condition

winter condition

Design Measures to take

m3. ecological corridors **m6.** physical encounter **m8.** narrate and listen to the landscape **m10.** soft and adaptive interventions

Involved Actors

n4. grasses
n6. groundwater
h1. farmers
h2. local residents

h3. summer tourists
h4. ski resort operator
h5. land owners

body scale location
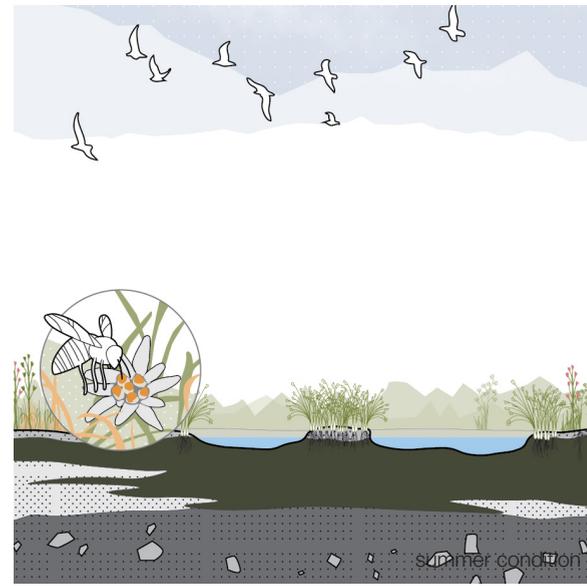
Practice of Care
Giving Space to Nature

Sometimes it is better for Nature to be left to its own. Highly sensitive habitats and species need to the utmost care and shouldn't be harmed by humans. Designating spaces explicitly to Nature helps them to become sanctuaries for endangered and endemic species.
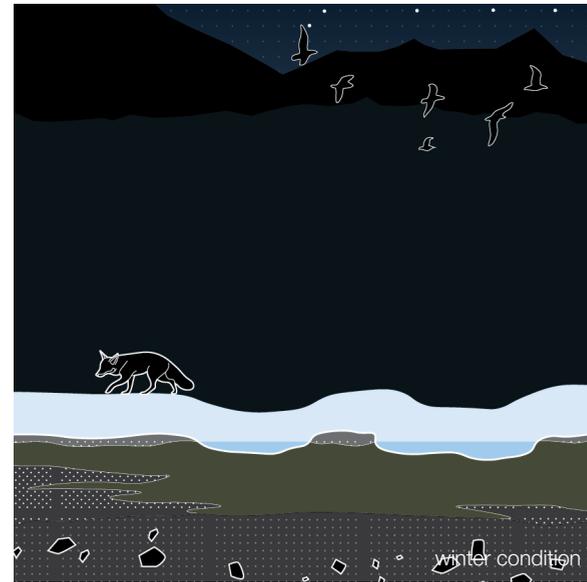
Design Measures to take

m1. restore and expand wetlands **m2.** restore and protect flowing water **m4.** niche habitats and sanctuaries

Involved Actors

n2. pollinators
n3. soil organisms
n4. grasses
n5. wetland plants
n6. groundwater
n7. flowing water

h6. municipality
h7. conservation groups
h6. artists and researchers

body scale location

Practice of Care
Keyline Development

small ditches along the contour catch water, leading to micto wetlands at the edge of flat areas. Dug by hand they are small, scalable interventions. Cows don't like to walk uphill, so over time they create paths along the contour as well, which can also serve as keylines. In that case, fertilization may pose a problem for some plants.

Design Measures to take

m1. restore and expand wetlands

m9. common seasonal land uses

m10. soft and adaptive interventions

Involved Actors

n1. cows
n3. soil organisms
n4. grasses
n6. groundwater

h1. farmers
h3. summer tourists
h5. land owners
h7. conservation groups

summer condition

winter condition

body scale location
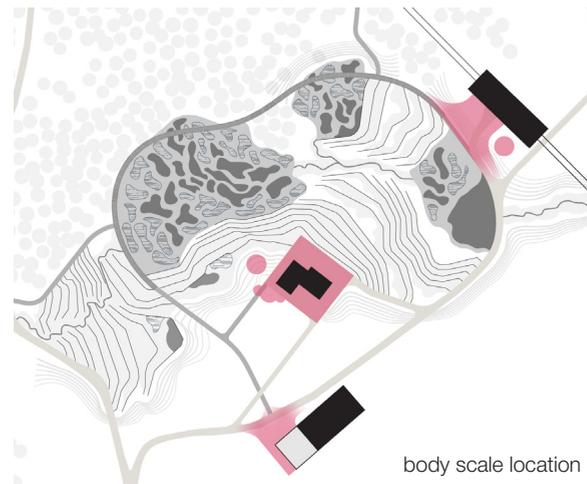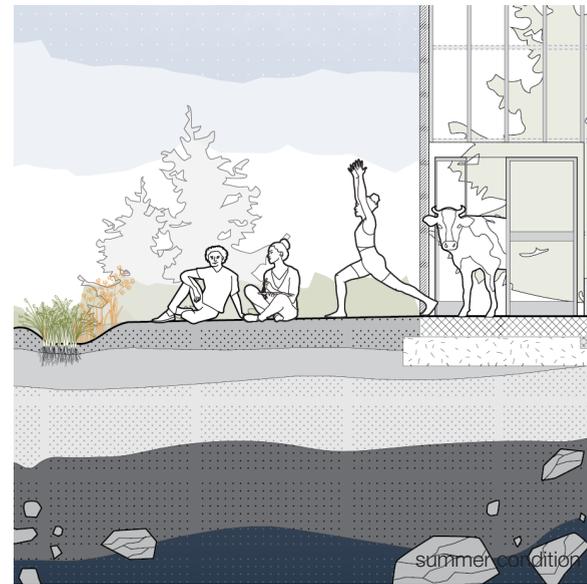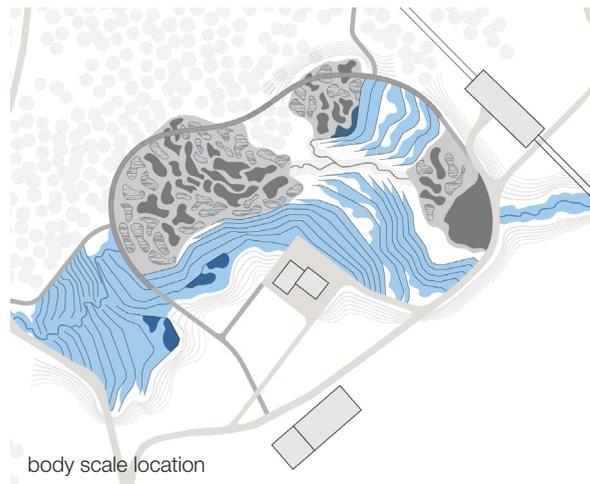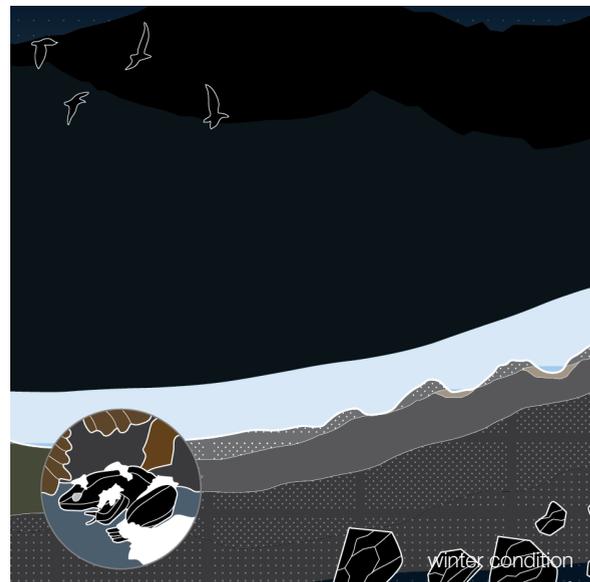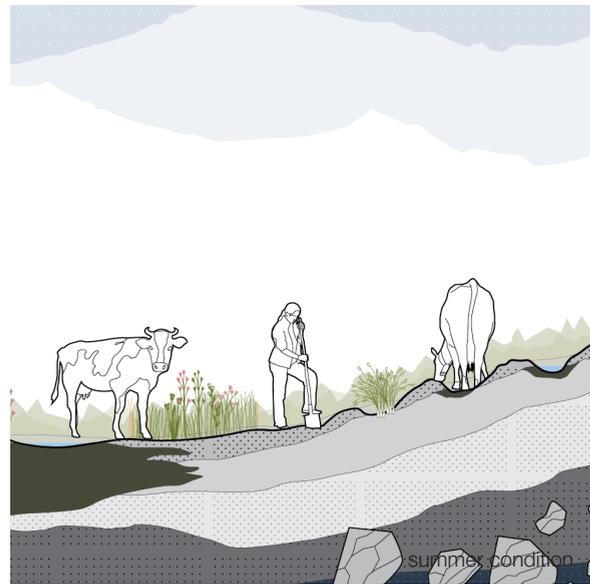
Practice of Care
Community Wellbeing

A space for community gathering outside offers the opportunity to community care, cultural practices, and arts of noticing in the landscape. At the same time, this is an edge condition between human and non-human spheres of influence and thus needs to be understood as a transition one.

summer condition

winter condition

body scale location

Design Measures to take

m5. garden transition zones

m6. physical encounter

m7. places for community and exchange

m8. narrate and listen to the landscape

Involved Actors
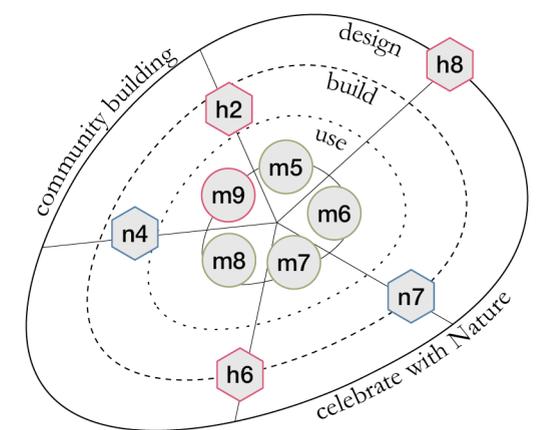
n4. grasses
n7. flowing water
h2. local residents

h6. municipality
h3. artists and researchers

Adaptive Re-use
Gardeners Cottage

Existing buildings without purpose can be reused to support the water garden. In this case, an old skilift station is renovated into a residence for artists and researchers. An annex as a greenhouse supports both landscape care and cultural functions. The building becomes a manifestation of the labour needed to care for the garden and the water landscape.

Design Measures to take

m7. places for community and exchange

m8. narrate and listen to the landscape

m10. soft and adaptive interventions

Involved Actors
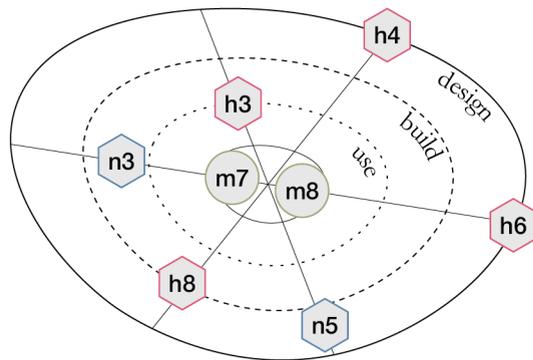
n3. soil organisms
n5. wetland plants
h3. summer tourists

h4. ski resort companies
h6. municipality
h8. artists and researchers

Body-Wetlands Scale
the Water Garden at Paliu Marscha

Landscape Care
(see page 205)

m1. restore and expand wetlands

m5. design garden transition zones

Circular boardwalk
(see page 204)
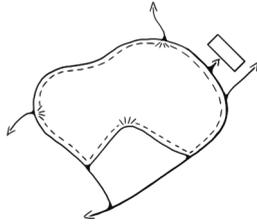
m3. grow small and large ecological corridors

m4. protect niche habitats and sanctuaries

m6. encourage physical encounter

Community Center
(see page 207)
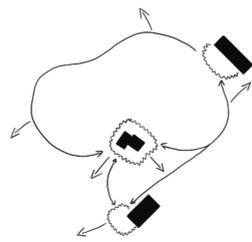
m7. create places for community and exchange

m9. common seasonal land uses

Adaptive Re-use
(see page 208)
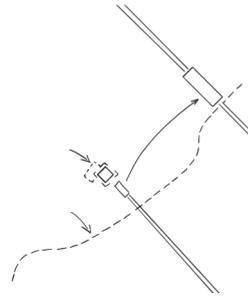
m10. develop soft and adaptive interventions

To achieve the goals of refuturing, the wetlands Paliu Marscha at Triel need to be revitalized and made visible in the landscape. This design is not a single intervention, but a gradual process of emergence taking a long time: peat grows under good conditions at round 1 mm per year. As for making the wetlands visible, I use the approach described by Joan Iverson Nassauer: to highlight 'messy ecosystems' which are important to the health of the environment, an 'orderly frame', i.e. a design intervention to frame the ecosystem, may help the human eye see and appreciate the ecosystem (Nassauer, 1995).

A number of interventions and practices make this design possible. The main infrastructural changes, the board walk, the wetlands care, keylines, and cultural programming together aim to make Paliu Marscha a recognizable place. The small scale of landscape care interventions allows humans and non-humans to explore their own agency by contributing visible labour toward a long-term goal.
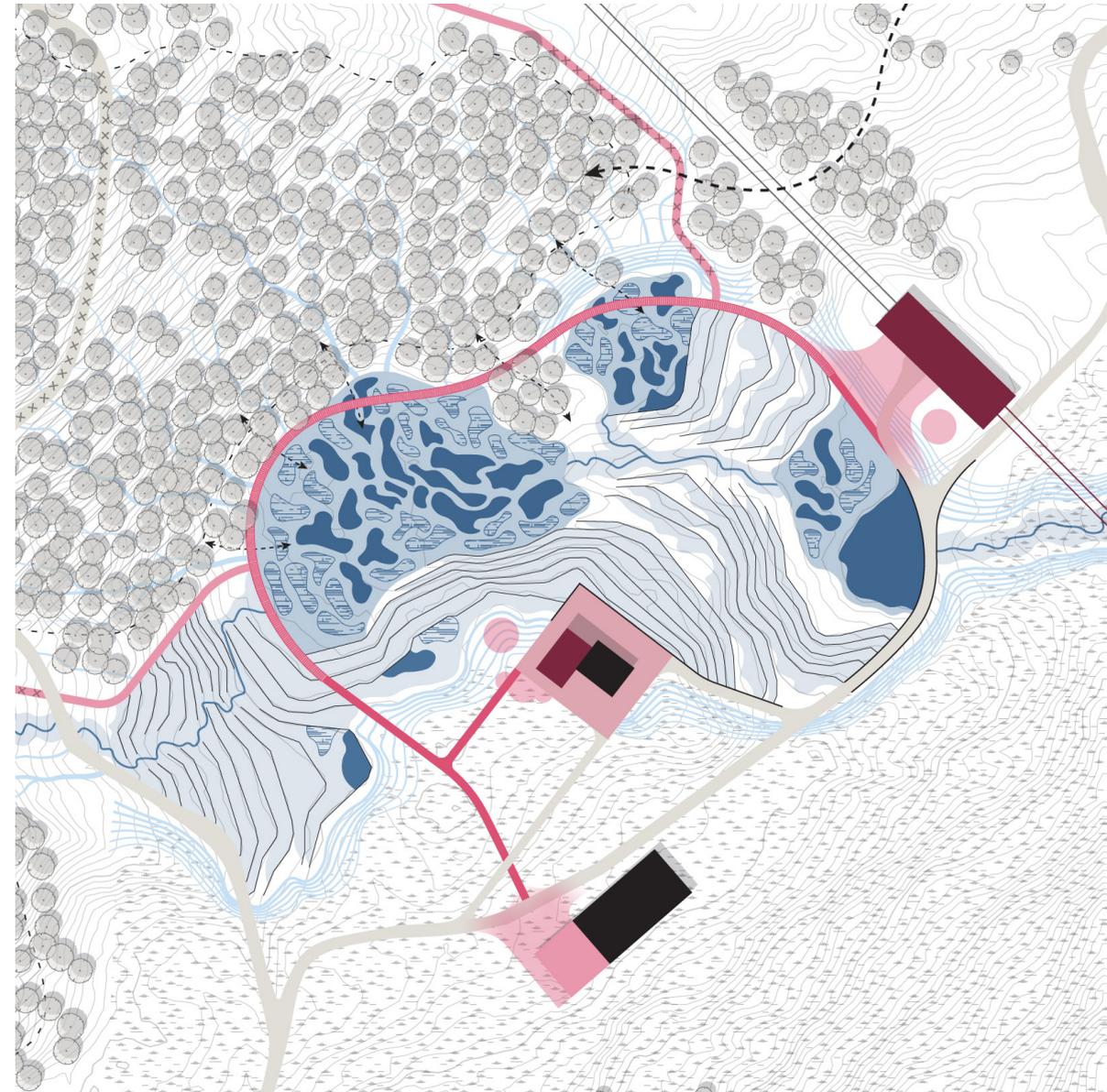
Figure 78. Spatial Strategy of the Body-Wetlands scale at Paliu Marscha and Triel above the village of Vella.

50m

scale 1:2000

■ standing water	▦ boardwalk
▦ swamp condition	■ footpaths
peat wetlands area	■ building existing
— streams	■ building addition
— keylines	community gathering area
garden transition zones	◄► ecological corridor
	restricted wildlife protection area

Emergence over Time

n7

h4 artificial snowmaking

n4 irrigation of pastures

n7
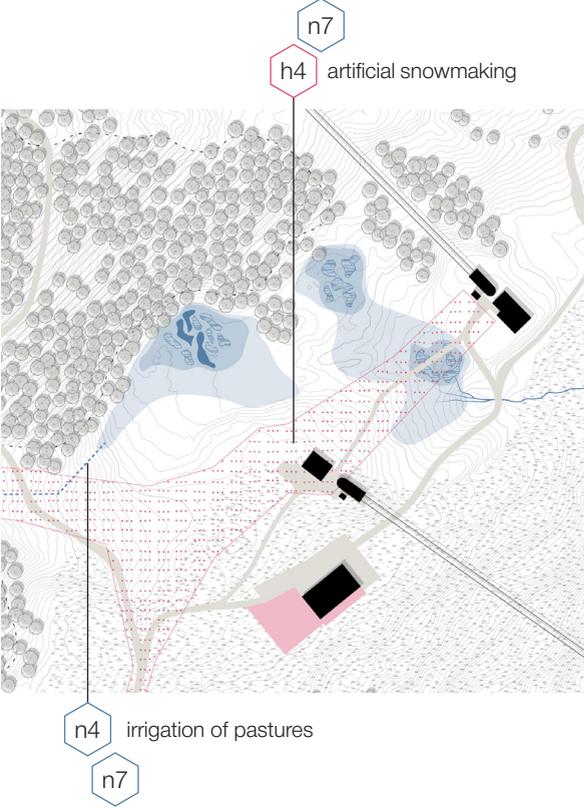
Current condition

The wetlands are small and invisible, the space dominated by snowmaking equipment and skilifts. The natural topography lead to the formation of these wetlands and gave the place its name, but they currently exist at the margins.

boardwalk construction h3 h6

n6

h1 n1

n3 h7 keyline construction and peat formation

1st step: boardwalk and keylines

Taking actions of revitalization and making visible, the boardwalk as an intervention serves to highlight the existence of the wetlands, while also restricting access. Meanwhile, the keylines gradually emerge through everyday practices.

h6

skilift redevelopment h4

h8 h6

n3 h2 gardeners cottage renovation
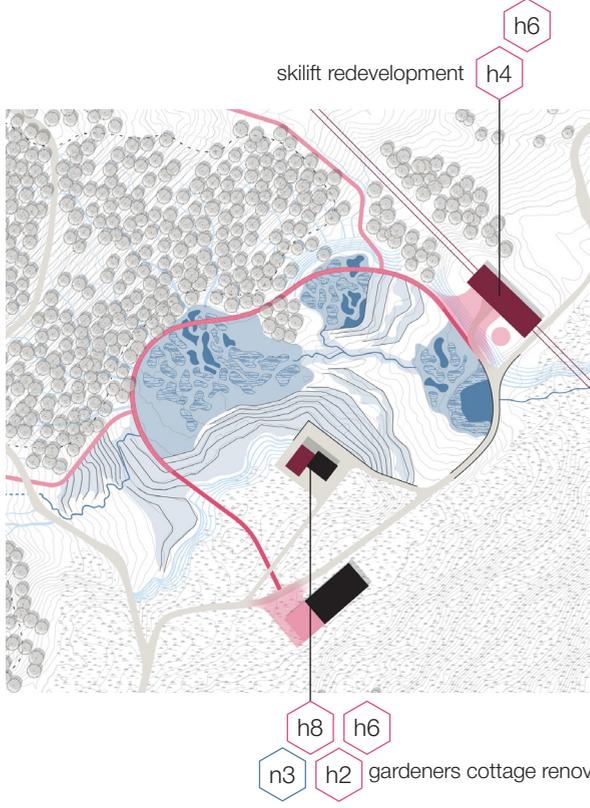
2nd step: skilift and gardeners cottage

The main infrastructural changes can happen in a second step in a prudent moment. The skilift is nearing the end of its designed lifetime, thus consolidating both lifts into one continuous one is viable, also freeing space for the wetlands. A dam connects the station with the other side, while retaining water, to create a pond. With the skilift gone, the remaining unused building can be expanded to fit the needs of the water garden and cultural programme.

landscape care n5 n7

n2 h8

n1 h8 cultural programming

h3 n7 h2
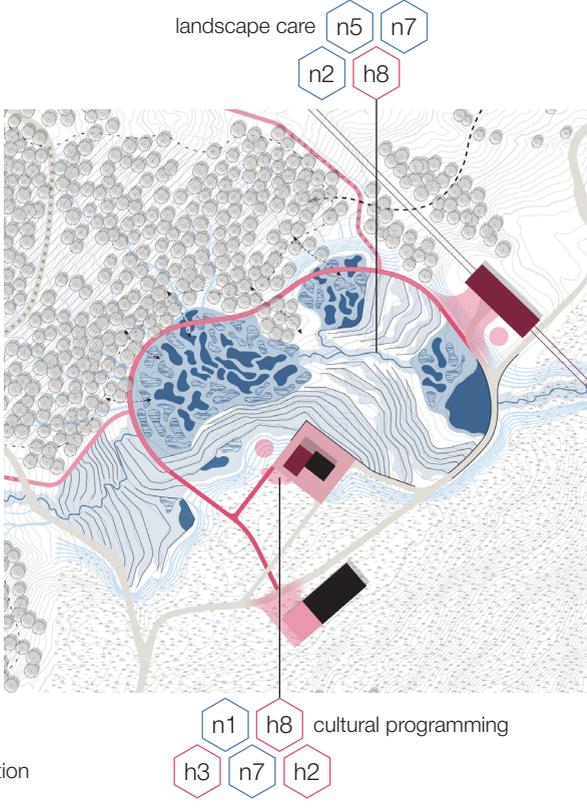
3rd step: emergence and maintenance

This garden requires continuous care and maintenance, it is also not strictly bounded and can thus expand further. The gardeners cottage is the manifestation of the human and non-human labour to repair and maintain the lifeworlds of Paliu Marscha.

Actors

n1. cows	**h1.** farmer
n2. pollinators	**h2.** primary resident
n3. soil organisms	**h3.** tourist
n4. grasses	**h4.** ski resort operator
n5. wetland plants	**h5.** landowner
n6. groundwater	**h6.** municipality
n7. flowing water	**h7.** conservation groups
	h8. artists and researchers

Local-Landscape Scale
Water Networks in Lumnezia

A necklace of wetlands
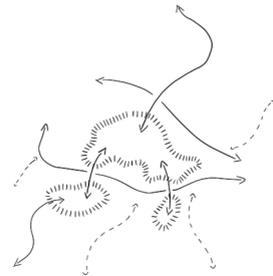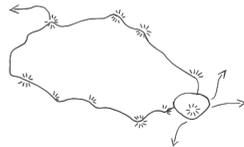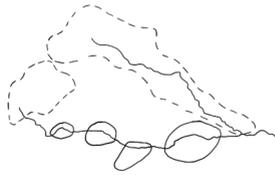
m1. restore and expand wetlands

m2. restore and protect flowing water

A trail of noticing

m6. encourage physical encounter

m8. narrate and highlight the landscape

m10. develop soft and adaptive interventions

An ecological fabric

m3. grow small and large ecological corridors

m5. design garden transition zones

m9. common seasonal land uses

The landscape above the town of Vella up to the summit of Pez Mundaun stretches about 2 kilometres in length and 800 metres in height. Compared to other stretches of landscape nearby, this area is varied in terms of land use: forested areas, wetlands, pastures and meadow lands form a mosaic of landscapes. Multiple streams conduct the water down and through the village in a mostly natural streambed. About halfway up is Triel and the Paliu Marscha wetlands, which is the site in the body-wetlands scale.

Connecting the varied landscape together is a triple network of wetlands, paths, and ecological corridors. The water garden becomes a ring of wetlands, a necklace, around a forest in the middle, which is restricted to hikers during some months of the year for wildlife protection. At Triel and Paliu Marscha the skilift connects this landscape with the valley floor and peak.
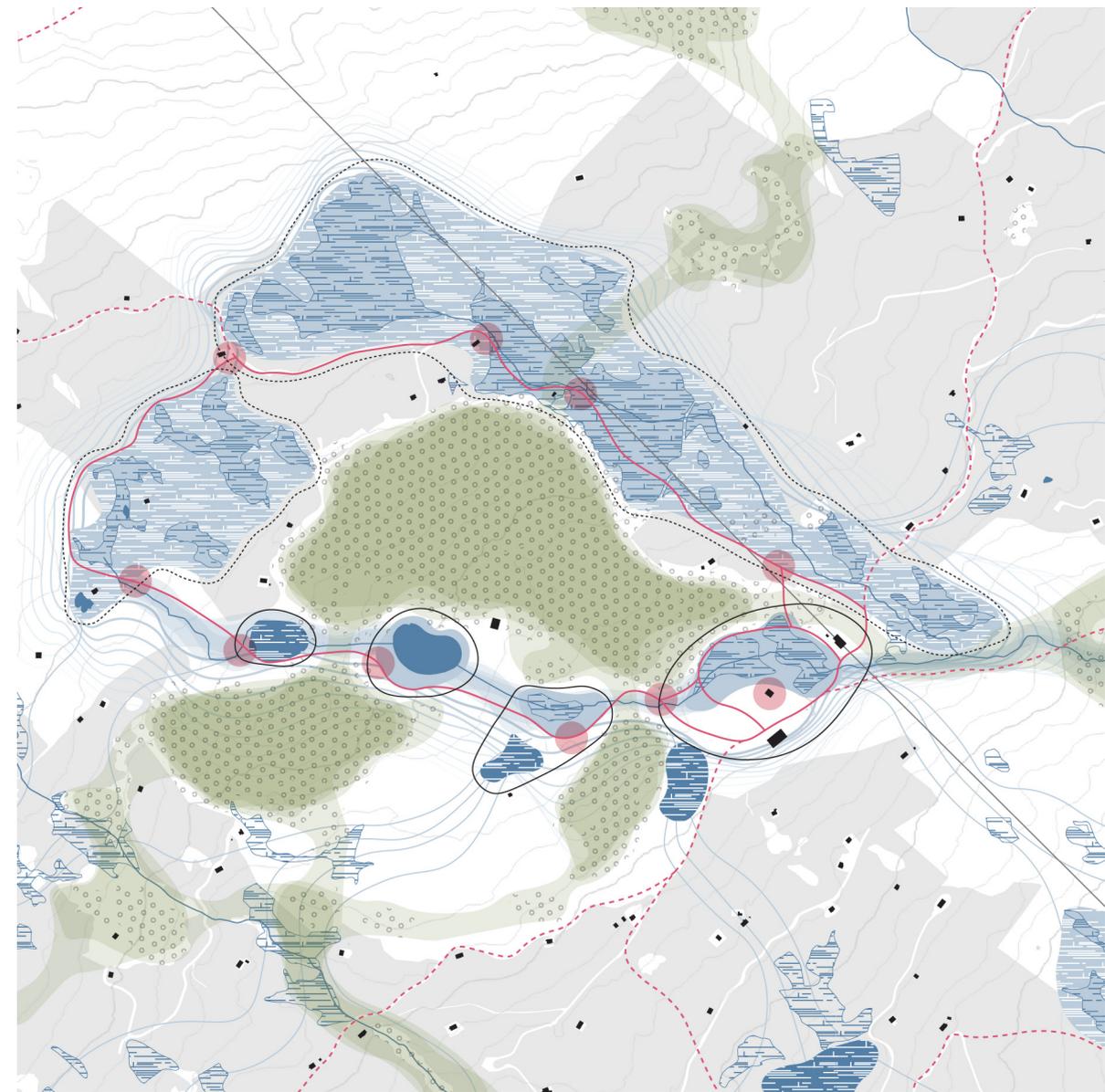
Figure 79. Spatial Strategy of the Local-Landscape scale, on the slopes of Pez Mundaun above Vella, a necklace of wetlands

existing wetlands
expanded wetlands
new wetlands
water body
streams
water corridors
garden transition zone

distinct wetland bodies
diffuse wetland bodies
wetlands trail
other trails
noticing point
protected wildlife forest area
ecological corridor

200m

scale 1:10000

Context of the Local Landscape
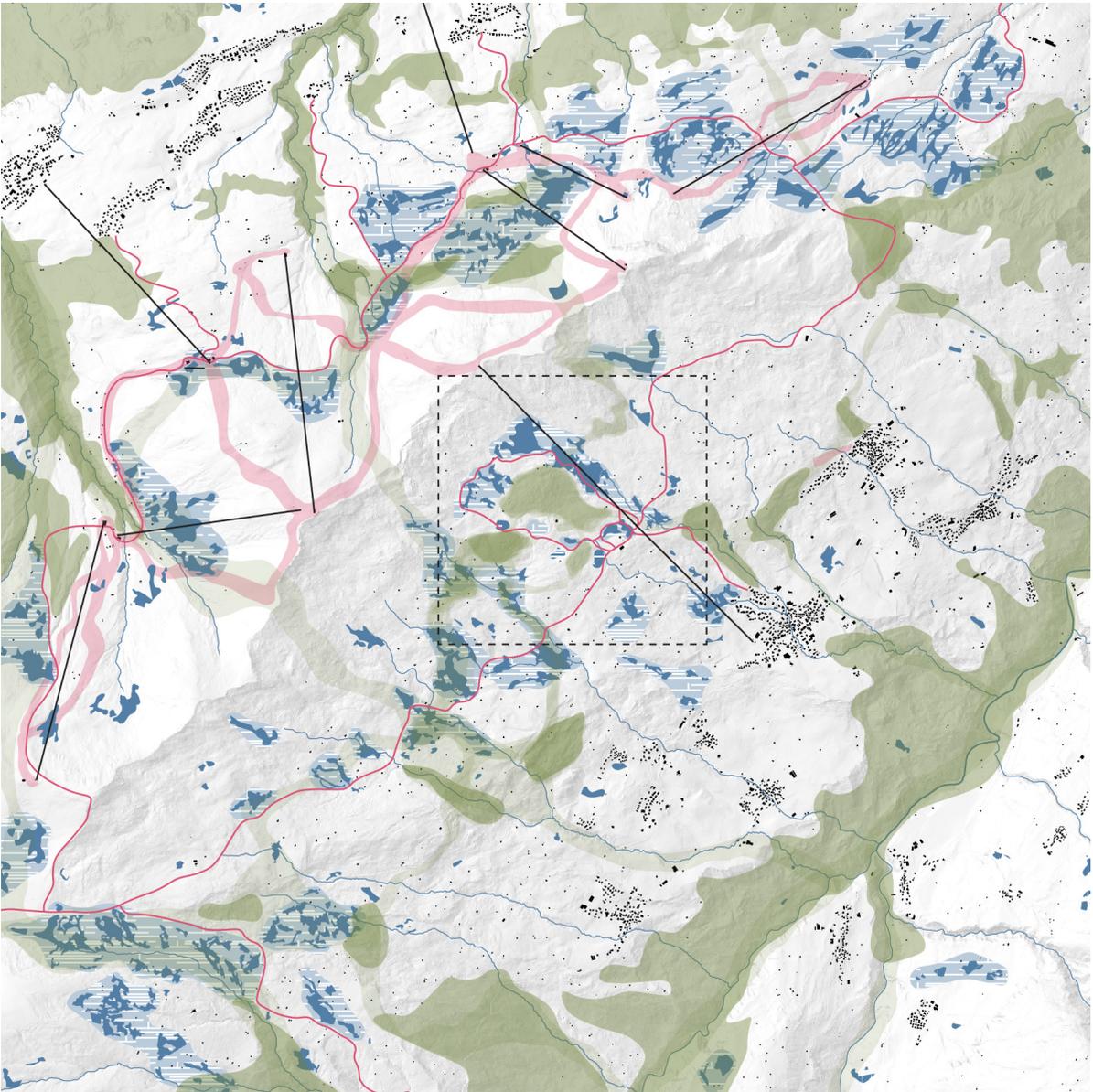
Figure 80. Context of the local-landscape scale. The water garden on Pez Mundaun.

▮ existing wetlands	— wetlands trail
▨ expanded wetlands	— viable skilifts
≈ streams	▰ viable ski slopes, respecting sensitive wetlands and forest areas
▮ forest area	
▮ ecological connections	

1km

scale 1:40000

Current Condition of the Local Landscape
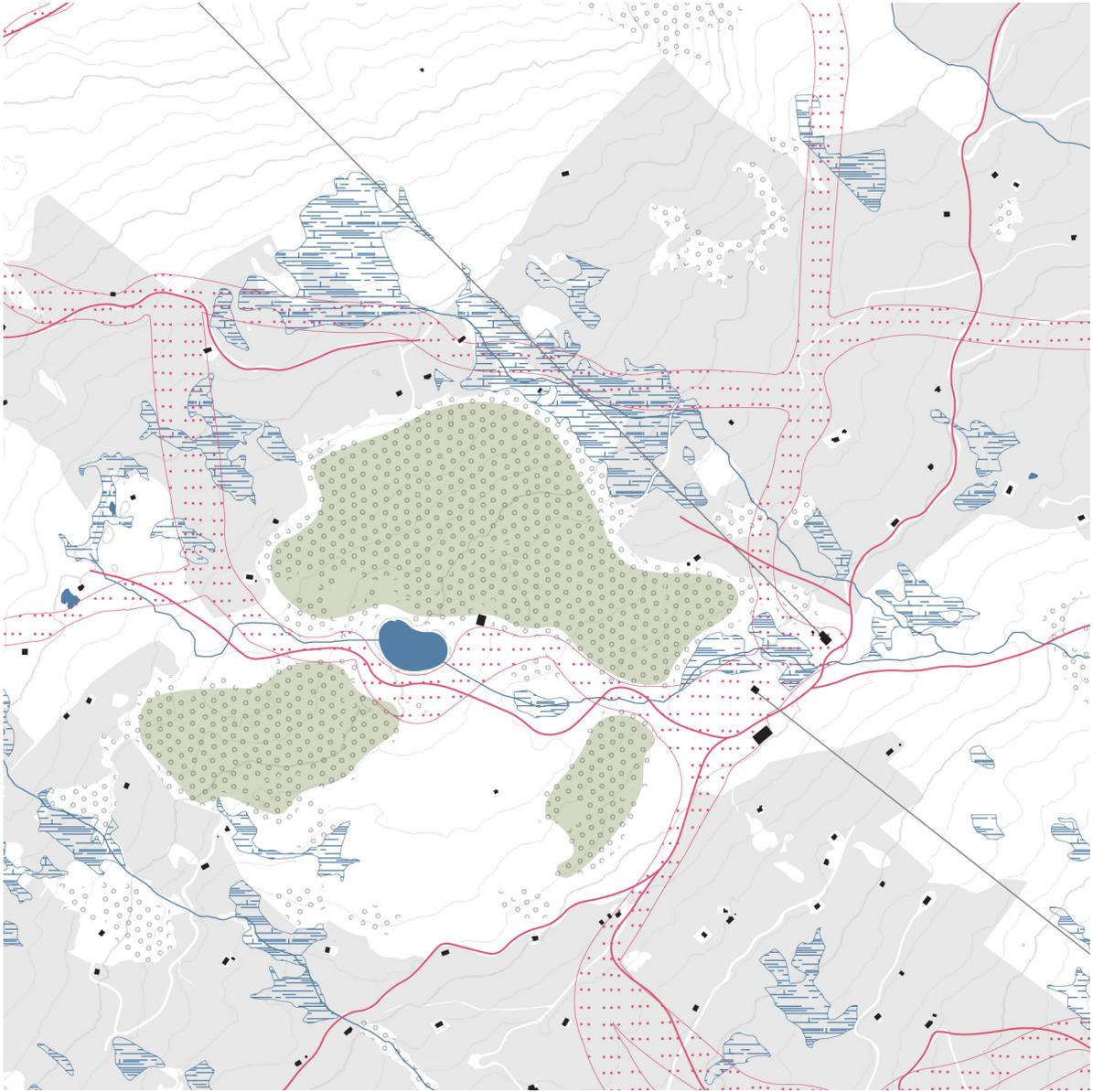
Figure 81. Existing conditions on the local-landscape scale.

▨ existing wetlands	
▮ water body	
— streams	
— trails	
⋯ ski slopes (seasonal)	
▨ protected wildlife forest area	

200m

scale 1:10000

Three kinds of Networks

If the logic of the body-wetland scale design is based on gradual emergence, the local-landscape scale design emerges through the interplay of three networks, all of which can emerge at the same time. The wetlands, ecological connections, and human noticing of the landscape and its distributed agency together constitute the water garden in this scale. The garden thus is bounded by the reach of interactions in each network: the path of water down the mountain slope, the roaming distance of a deer, and the stamina of a hiker. Through the intersection of these networks the garden unfolds: interaction becomes intra-action, placing emphasis on the points where the networks crisscross each other.

Fontauna Nera
liquid landscape

Russein
cascading micro-wetlands

Trutg da Stiarls
revived wetlands

Plaun Lom
bathing spot repurposed reservoir

Cauma Su
secondary body

Paliu Marscha
main body
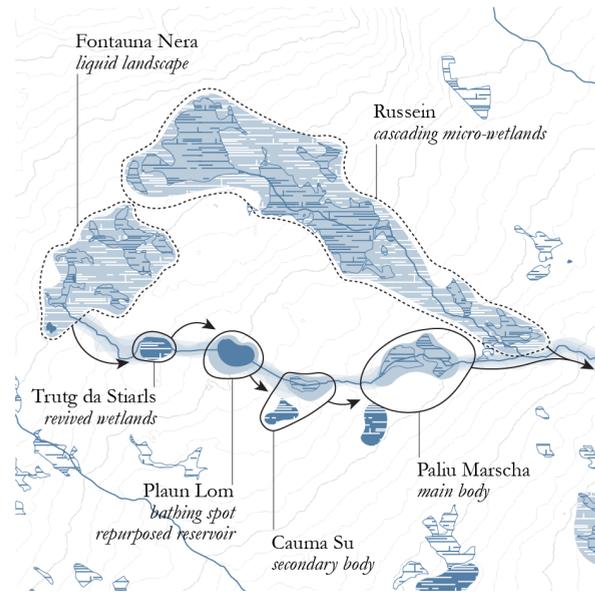
A necklace of wetlands

The natural formation of wetlands in the landscape lends itself to the form of a necklace: individual beads forming a ring. In this case, as water only flows in one direction, it is a broken necklace. A cascade of four discrete bodies presents the highlight of this landscape, complemented by two diffuse wetland landscapes.

Fontauna Nera
notice the undulations of the landscape

Crest Plan
notice the gargling waters hidden beneath the pasture

La Tegia
restaurant

Russein
notice the diverse species of grasses

Trutg da Stials
notice wetlands in growth

Plaun Lom
notice Nature taking back infrastructure

Cauma Su
notice insects hovering above the water

Paliu Marscha
notice more-than-human agencies and community

A trail of noticing

The local landscape of the water garden is not easily noticeable, the terrain undulates, hiding most of the wetlands. A circular path along the necklace highlights them and invites noticing more-than-human and nonhuman life. To minimize impact on the landscape, much of the trail uses existing paths.

movement along the contour
movement along the water
movement toward the valley floor
movement from niche to niche
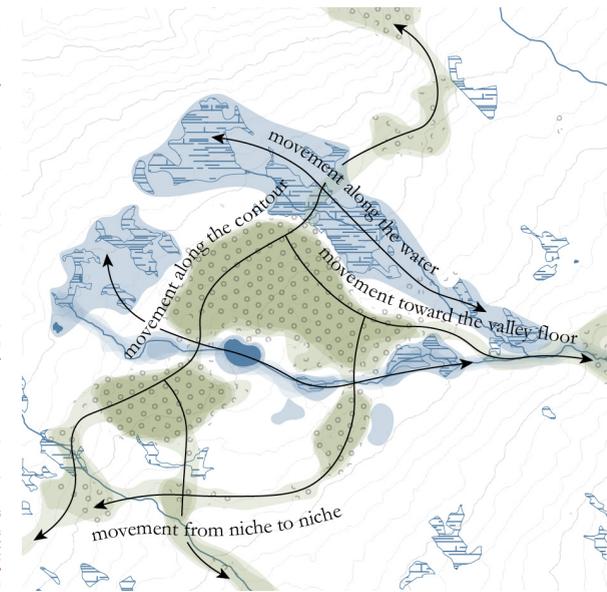
An ecological fabric

As part of the existing landscape of the valley, the water garden is permeable to all forms of movement, along the contour, down to the valley, or vertically into the air. The fragmentation of the culture landscape is augmented by a network of connections for nonhumans to live as-well-as-possible.
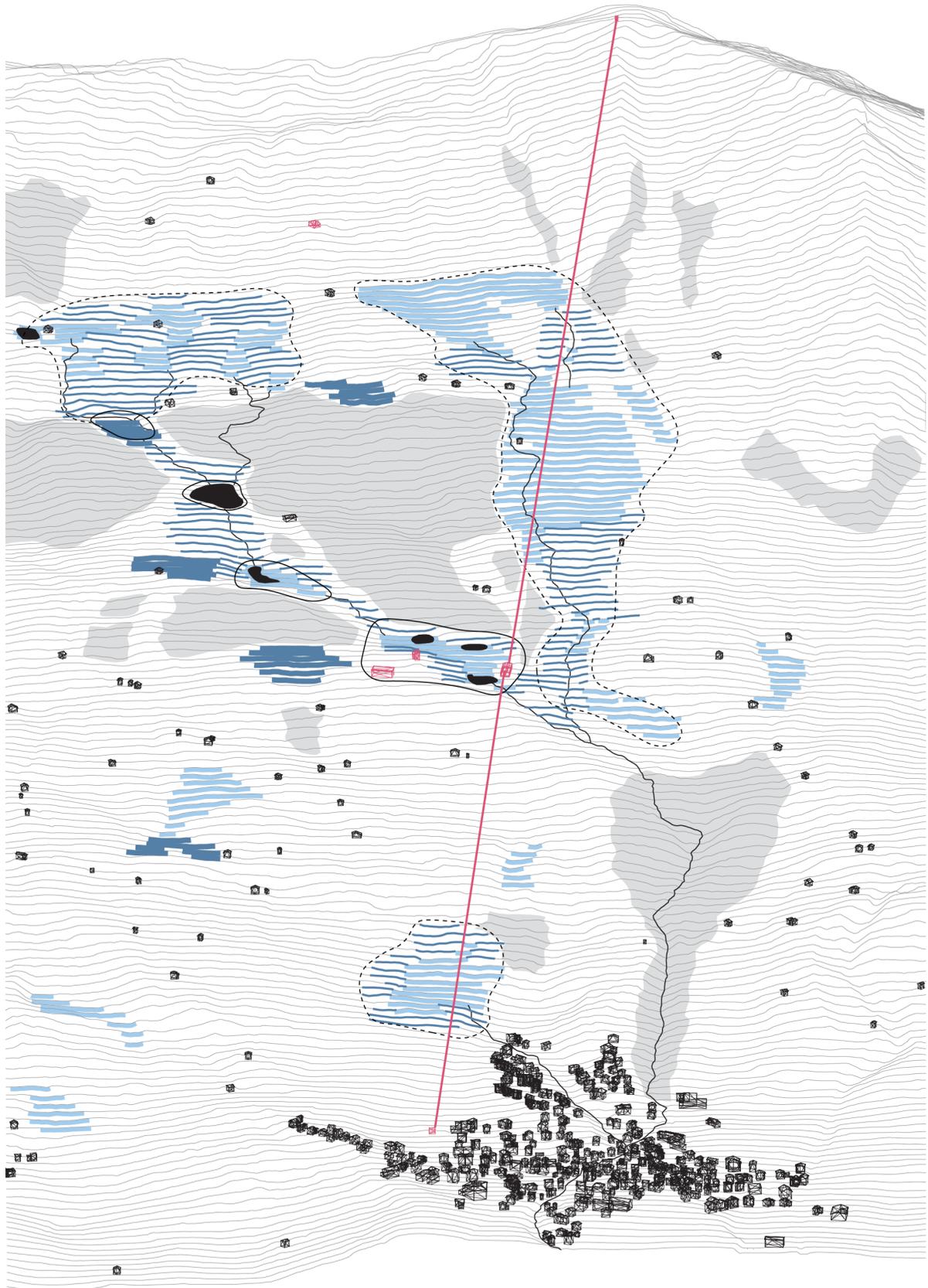
Figure 82. The landscape above the
town of Vella and below Pez Mundaun.
A strategy of connecting wetlands.

Regional-Archipelago Scale
Water Culture Landscapes in the Alps

multiply water gardens	upstream water storage	diffuse landscape park	regional cooperation and knowledge exchange
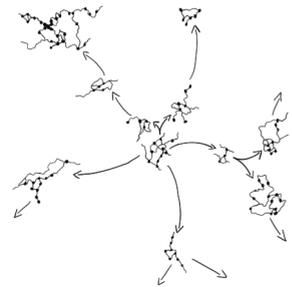
m1. restore and expand wetlands

m7. create places for community and exchange

m2. restore and protect flowing water

m3. grow small and large ecological corridors
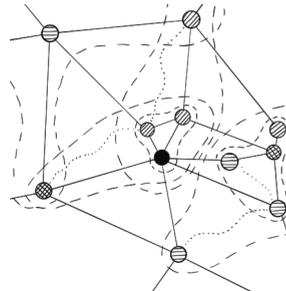
m7. create places for community and exchange

m9. common seasonal land uses

On the regional level, an archipelago of water gardens and landscapes emerges through the transfer of knowledge, both institutional and cultural, from the Lumnezia valley to those other sites. This action can foster a sense of identity, a larger shift in the perception of water in the culture landscape. Implementing the Water garden on a regional scale can also seriously impact the water storage capacity of the Alps, subsidizing the melting glaciers and ensuring the "water tower" function of the mountains for the rest of Europe.

Seeing the water garden on a regional scale has many spatial impacts apart from the local implementation of wetland care and maintenance measures, and from developing alternative forms of tourism toward the landscape. Regional ecological corridors linking the wetland ecosystems together emerge on the map, and diffuse landscape parks ensure the value of the Water Culture Landscape in legal frameworks and the collective memory of the region. Some rivers may measure significant differences in water flow after rain events or during the spring snow melt.
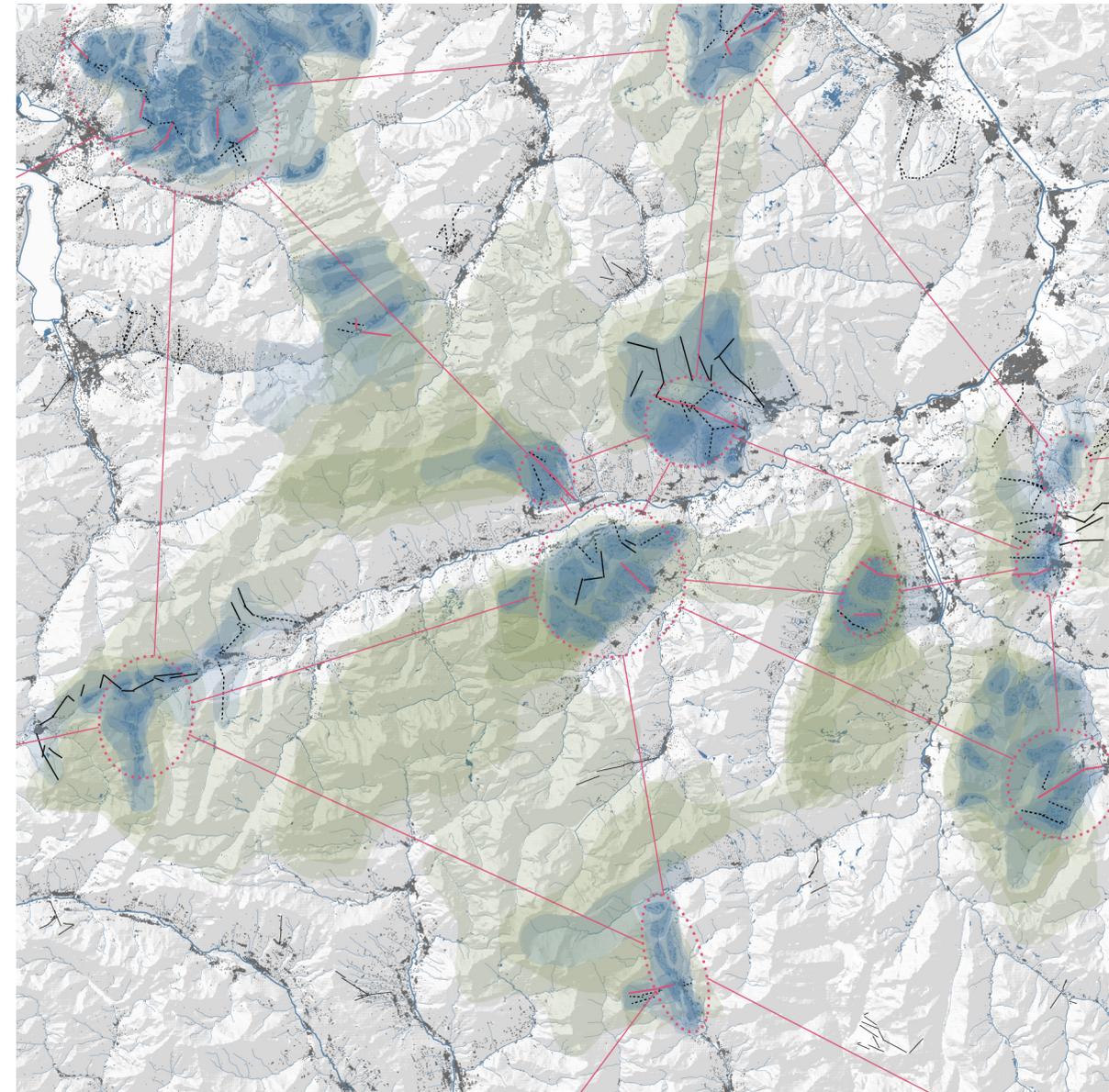
Figure 83. Spatial Strategy of the regional-archipelago scale, water gardens emerging and forming networks.

10 km

scale 1:500000

- existing wetlands
- water garden bodies
- water garden landscapes
- diffuse landscape parks
- ecological connections
- institutional connections
- rivers and streams
- skilifts still in use for winter tourism
- skilifts in use thanks to water gardens
- skilifts out of use because of a lack of snow
- settlements

Expansion Sites

On an institutional level, establishing working relationships between valleys is a good way to foster other collaborations, in a bottom-up manner: valleys cooperating with each other, without direct involvement of higher-level administrative levels. Keeping the discussion local-scale opens up new understanding between the valleys, as they have similar perspectives. It is also possible for cantonal administrations to coordinate efforts, but they must not dictate measures top-down.

Each site is different and unique, though they share certain characteristics with each other. Expanding the water garden concept to the immediate neighbors of Lumnezia is the first step, from there the archipelago emerges.
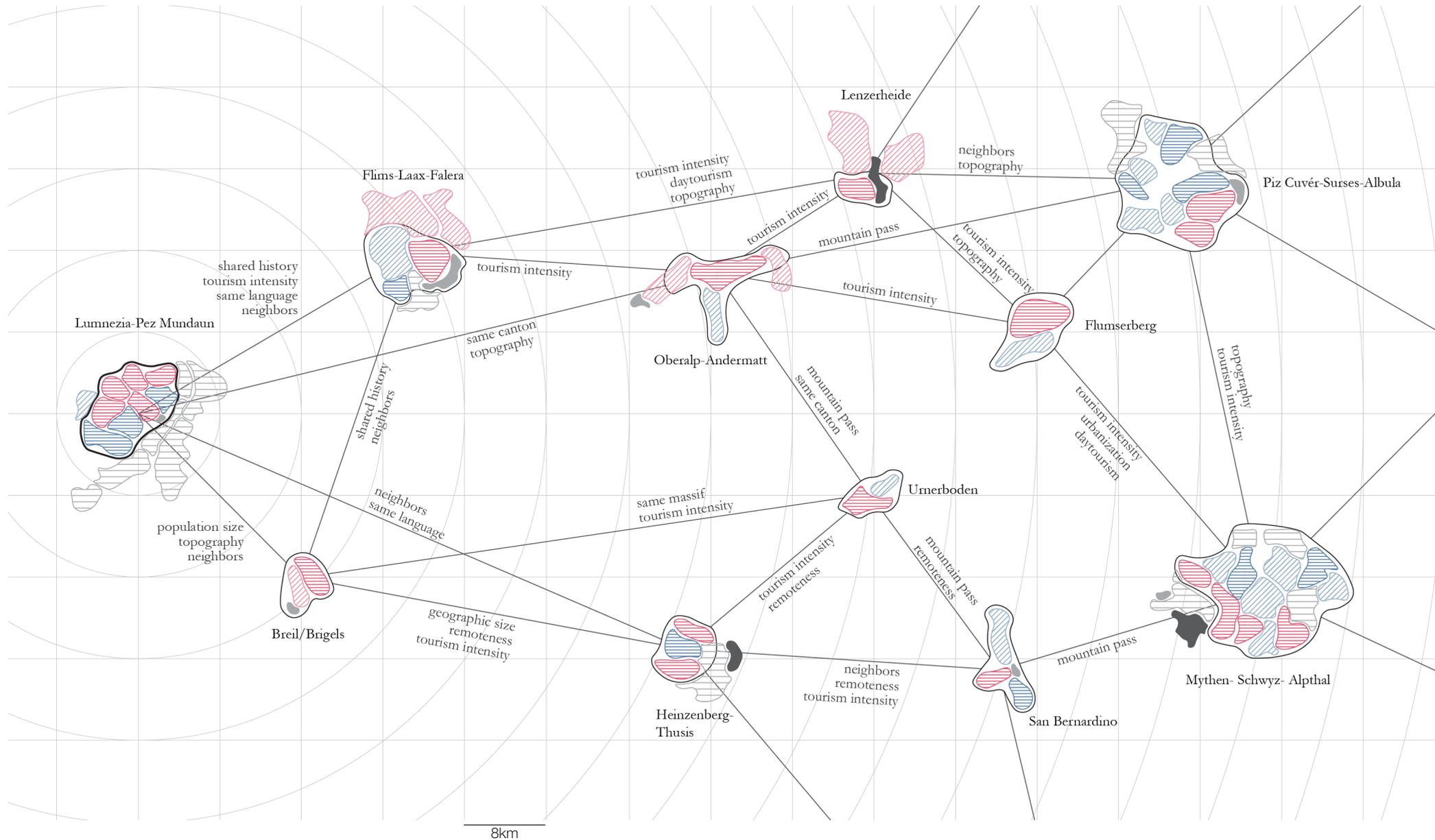
Figure 84. common characteristics of expansion sites for the water garden

wetlands
no wetlands

high-alpine
agriculture
tourism

8km
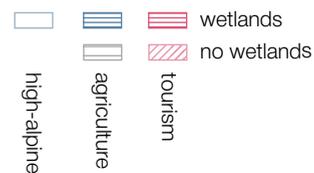
Chapter 6

Refuturing

Across this thesis I explored the matter of defuturing and refuturing. In Chapter 1, the alterations and limits of the Alpine territory illustrate the narrowing of possible futures through ongoing operationalizations of landscapes. I arrived at the problem statement that there is no prescience of possibilities within a purely human-centred and growth-oriented framing of the Alpine space.

Chapter 2 has brought the reconceptualization of Nature as a resource to partnership with Nature to the forefront. The parliament of things as a pillar of the conceptual framework may serve as the vehicle of change from defuturing and deterritorialization towards refuturing and reterritorialization. Within the literature on natureculture and nature jurisprudence a lot of possible paths can be found.

Chapter 3 explored the major and minor stories of the Lumnezia valley. The dominant ontologies of the Alpine space are illustrated including the popular narrative beats of a space of Nature, a space of decline. Underneath, hidden realms of alternative ways of sensing and seeing the landscape emerge. A mosaic of viewpoints which include the popular narrative, but also contrasts and contradictions, shows alternatives not just in the future, but also in the present and past tense when talking about the Alps.

A systematic review of actors and processes in chapter 4 serves to highlight the interdependencies: between processes, between actors, scales, timeframes, rhythms, and landscapes. Sensing who and what actually has design power in the Lumnezia valley provides an arsenal of approaches apart from the modernist-capitalist capital-D.

The water garden in chapter 5, finally, is my own contribution to the discussion of the future. It is a proposition of thinking the landscape through water, and the wetland-body liquid-landscape and archipelago-region are testbeds to experiment and speculate – fabulate – possibilities of being and relating. While the water garden features concrete interventions, it thrives on its fluidity and possibilities for change. Nothing I show in chapter 5 has to be implemented by heart, on the contrary! A proposition is always an invitation to discussion, and discussions about the future are needed.

Refuturing as Practice and Politics

In this final chapter, I take space to draw conclusions—but also to chart pathways toward refuturing, grounded in both theory and practice. If defuturing represents the ongoing erosion of liveable futures through extractive design and policy, and if futuring encompasses our attempts to project and imagine what might come next, then refuturing, as articulated by Tony Fry, is a design ethic and political strategy to reorient human activity toward sustainment, not collapse. It calls for fundamental shifts in how we design. Refuturing demands design to move from short-term logics of consumption and control, to supporting long-term viability and co-existence. It is a commitment to ongoing, relational, and situated transformation.

Refuturing demands more than a shift in intention—it requires a transformation of design practice itself. This means rethinking design not as a solution-delivery mechanism, but as a generative and socially responsible encounter. Rather than making futures by some for others, refuturing positions design as a facilitator of collective world-making, where diverse voices—human and more-than-human—can contribute to shaping shared spaces and futures.

In this light, design becomes a practice of attunement: to rhythms of place, to ecological dependencies, to historical wounds and future possibilities. It must be capable of listening, interpreting, and negotiating—not just imposing. The designer's role shifts from author to mediator, from visionary to caretaker, from expert to participant among many. This reorientation also extends to material practice: embracing slowness over speed, repair over replacement, and continuity over novelty. Design is no longer a linear project but an ongoing process of situated maintenance, negotiation, and transformation.

Refuturing is inseparable from the idea of reterritorialization: it calls for re-embedding human activity in specific ecologies, cultures, and material conditions. It refuses the abstraction and standardization of space in favour of situated, relational design. It demands new forms of governance—less central, more participatory; less human-centred, more multi-species. It recognizes that the production of space is also the production of time: to design space is to design futures.

The water garden can be seen as a site of refuturing—a place where different rhythms, agencies, and values intersect. It shows that to care for a place is also to imagine it otherwise. And this act of imagining otherwise is at the heart of refuturing: it is a refusal of inevitability, a resistance to passive decline, and a proposition for ongoing, collective making.

In this chapter I propose a framework for alternative futures, containing specific steps toward refuturing—small but significant shifts in governance, economy, and care—rooted in the Lumnezia valley but extendable to the Alpine space more broadly. These steps do not claim to be definitive. Rather, they invite participation in the slow, collective process of crafting futures that are liveable, just, and deeply rooted in place.

A Framework for Alternative Futures

This framework illustrates a relational model of refuturing in the Lumnezia valley, where ontologies of care, multispecies commons, and alternative modes of exchange emerge through distributed, more-than-human interaction and co-creation. At the heart of the system lies the Water Garden—not as a fixed object or outcome, but as a living, evolving site of encounter, negotiation, and reciprocity. It is simultaneously shaped by the non-human actors at its core and by the human and design practices that reach toward it from the outer rings. The garden becomes a crystallization point—a tangible place where diverse agencies intersect, and where refuturing is tested and materialized.

The designer does not occupy the centre, but rather moves along the periphery, activating possibilities, sensing needs, and creating scaffolds for emergent collaboration. Through overlapping and entangled networks of care, commons, and exchange, futures are not imposed but co-created, crossing ecological, cultural, and temporal boundaries. In this model, design is not about authorship but about holding open the space for shared becoming.

Figure 85. Framework for alternative futures, overview

Ontologies of Care

The Alpine space is facing a crisis of identity. Is the Lumnezia valley a winter tourism destination, a second-home holiday village, or a left behind space ? Understanding what has always been the main practice in the valley may be the answer to this crisis: for a thousand years the landscape has, through labour and care, become a culture landscape. In the Alpine space, Nature is seen by many but as a partner, which can be the core for the human and non-human communities to become one, through matters of care as a practice of labour, affection, and ethics/politics (De La Bellacasa, 2017; Tronto, 1991). Dominant ontologies of the landscape, capitalist operationalization, are deterritorializing and defuturing the Lumnezia valley. Emergent ontologies of care are needed: labour invested into caring for the landscape and others can repair some of the ontological damage that has been done, and it can show ways forward for the community.

The water garden is an emerging reconceptualization of the landscape, highlighting the distributed agency of humans and non-humans. Ontologies of care actualize these agencies into actions, practices – care-work, while centring this labour against the prevailing imaginaries of the left-behind space. If the Lumnezia valley is indeed the alpine fallow land as Diener et al. (2005) suggest, the more-than-human communities are continuously repairing the fallow lands, making them habitable as-well-as-possible.

Considering Puig de la Bellacasas' thinking with care, Refuturing should also bridge the apparent gap between ontologies and epistemologies of care: That care is an active verb, not just a state of being (De La Bellacasa, 2017). To care for means to engage and to think about someone – in fact to think-with someone possessing their own agency. Assuming caring to only be a state of being can and will lead to a state of neglect, constant effort needs to be taken: "actual and tangible care is never self-evidently 'there', but rather always and everywhere 'on the line'" (Brons, 2019). It's one thing to seeing the world as relational where care is a fundamental mode of being, it's another to practice ways of recognizing, valuing, and articulating care, both are eminently important. The situated communities of Lumnezia both live and know care, after all. And so, refuturing means to recognize care itself as a part of the future, as well as the way to get there. Simple practices like mowing meadows by hand (rather than by machine) translate labour into maintenance for the hundreds of species who thrive in this ecosystem.
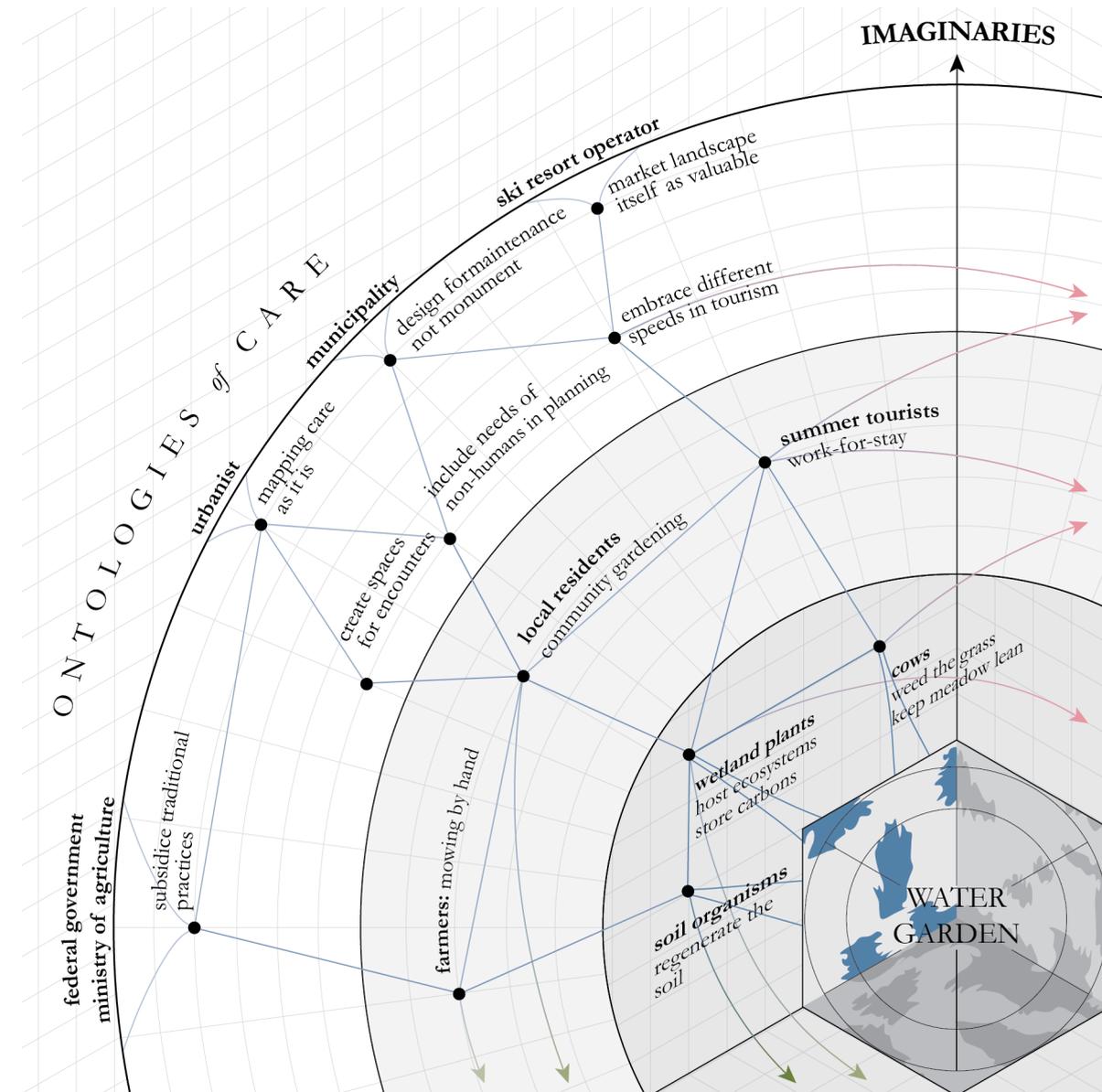
Figure 86. Framework for alternative futures, Ontologies of Care

Multispecies Commons

Agency increases with community. A hundred disparate farmers can only affect change so much. In Switzerland, society at large has understood the role of agriculture as the main care workers in the landscape, and is attempting to steer efforts for fostering biodiversity through farming subsidies. Collective care for the landscapes has existed in the Alps for a long time: the *Allmende* (commons), which has largely disappeared, is one such example: A space that is accessible to farmers and villagers, often with a policy framework in place to regulate over-use. The *Alpkorporation* (Alpine farming co-op) is another, organized as an association or company with democratic structures which manages summertime pastures.

These systems of land-management can serve as basis for a different practice of managing space, along with not seeing Nature as resources, but partner, which includes the cows, birds, reeds and waters of the Alps. Their needs and wants can be understood and acknowledged, along with their own agency and capabilities within a framework for managing the land. To foreground the co-creative force of multispecies commons the attunement to non-human presence through affective, aesthetic and sensory engagement is needed (Haldrup et al., 2022) – through "Arts of noticing" (Tsing, 2015, p. 17). In a community of (relatively few) humans and non-humans, direct interactions between the members may facilitate direct arts of noticing. In larger groups interpreters and messengers are needed, be they for humans or non-humans – which demands ethics and accountability of those messengers.

Nature and non-humans in Switzerland are not recognized as legal persons on a national level. But someone has to make a start. Multispecies Commons as democratic institutions give humans and non-humans representation and decision powers. While humans can state their preferences, non-humans may reveal them through signs, behaviours, presence and absence, and affective relations. Human interpreters or representatives, noticers, may see non-humans as their constituents.

Including non-humans in the decision-making process may fundamentally improve those decisions (Bonnedahl & Heikkurinen, 2018; Kujala et al., 2019; Neumayer, 2012; Starik, 1995). Eco-centric stakeholder management is in its infancy, the room to experiment is large and necessary. The water garden is such a testbed.

Figure 87. Framework for alternative futures, Multispecies Commons

Alternative Modes of Exchange

While ontologies of care and multispecies commons form the ecological-affective and social-political basis of alternative futures, these must also be supported by alternative economic-labour imaginaries, alternative to extraction, individual gain, or touristic consumption. Open market logics and money as their language are proving insufficient to the social and ecological fabric. Mountain regions are structurally disadvantaged within global economic systems due to their remoteness, fragility, and limited scalability (Chand & Leimgruber, 2016). But at the same time, this marginality is not just a deficit, but it can turn into a condition for creative alternatives: "inhabitants of mountain regions are not narrow minded when it comes to take decisions that are related to their survival." (Leimgruber, 2017, p. 273)

In the current system, landscape care is monetized through subsidies, compensating farmers for maintaining ecological infrastructure. While this ensures certain practices and does lead to ecological results, it also commodifies care, threatening to alienate it from its cultural, affective, and ethical roots (Dombroski, 2020, p. 160; Tronto, 1991). In the Lumnezia valley, landscape care is historically a cultural practice, going beyond mere utility of caring practices. Alternative visions of care compensation could be less about "an individual return on investment and more about the enrivonmental and psycho-social benefits of care [for] the broader human/non-human community economy of care" (Dombroski, 2020, p. 160).

Commons as a Framework for Value and Exchange

The multispecies commons offer an alternative to market-based value systems. These are not just about the equitable distribution of shared resources—they also recognize the labour of both humans and non-humans as contributors to the health of a shared landscape. In such systems:

- Value is plural: it is social, ecological, and relational, not just monetary.
- Everyone shares in responsibility and benefit, with governance structures that can include human representatives for non-human actors.
- Exchange also includes time, labour, skills, and knowledge.

Still, modes of exchange become necessary when value leaves the commons—as with agricultural exports, tourism, or when external goods

Figure 88. Framework for alternative futures, Alternative Modes of Exchange

and services are needed. Here, cooperative structures can create bridges between internal and external economies. Models already exist, such as community-supported agriculture, where consumers outside the region invest in a producer's livelihood and receive food in return. This concept could be extended to an entire valley: "friends of the valley"—a distributed cooperative of consumers, tourists, and supporters—could invest in Lumnezia's landscape care and cultural infrastructure in exchange for shared goods, access, or participation.

Tourism as Care-Based Participation

A new tourism model could follow similar principles. Instead of passive consumption, visitors could participate in the life of the place through labour-for-stay programs, where accommodation and hospitality are exchanged for time spent in landscape or animal care. This fosters a deeper sense of connection and transforms guests into co-gardeners of the Alpine environment. These are not hypothetical schemes—many Alpine pastures already rely on seasonal help from people drawn to the physical work, natural surroundings, and sense of community (ARTEde, 2025). The Water Garden can serve as an entry point into this participatory economy, offering tangible opportunities for visitors to contribute to the wellbeing of the garden and its non-human inhabitants.

Beyond physical labour, knowledge, skills, and artistic practice can also serve as currencies of exchange. Artists, researchers, and educators could take up residencies in otherwise vacant second homes, offering their knowledge or creative outputs in return. Their contributions might include ecological observation, storytelling, design interventions, or workshops with local residents. These exchanges would not only support ongoing cultural and scientific inquiry, but would also enhance the "arts of noticing" (Tsing, 2015), making the lives and needs of non-human actors more legible and appreciated within the human sphere.

Coda

Conclusion

Wrapping up part III, Walking-With, Juanita Sundberg reminds designers of the need for solidarity, reciprocity, and mutual co-production with the space. This part, the Water Garden and the Framework for Alternative Futures, is not a masterplan, but an invitation to walk with the landscape and the human, non-human, and more-than-human actors that make the Lumnezia valley.

The water garden is a speculative, yet practical proposal, operating across three scales: the body-wetland, the liquid landscape, and the regional archipelago. Introducing water to the culture landscape gives shape to care, maintenance, and cooperation in the Alpine landscape, emerging from small and medium interventions and everyday practices.

Chapter 6, Refuturing builds a theoretical scaffold supporting the design proposal: The framework maps out three pathways for action: ontologies of care, multispecies commons, and alternative modes of exchange. They can be used flexibly, adaptively, and in tune with local realities. The water garden is not a blueprint, but a testbed for this co-creation effort, place- and principle-driven.

With the method of research-by-design, these two chapters offer insights into the fourth subquestion of my research: How can urbanists and designers set a framework for pluriversal autonomous design toward sustainment in the Alps? I will expand on the answer to this question on the next pages, but it is clear that urbanists need to take care. Care to include diverse voices in the design process. Care to listen to the unheard. Care to sense rhythms and pulses, recognizing multi-species logics of time, traditional seasonalities, and deep time echoes. And they need to care to walk together with others at their pace. This is not to say that the designer becomes passive – far from it! A designer aiming toward sustainment has a lot of work to do, to properly understand, and include others, into their design process.

Certainty simplifies things – a remarkably human design. But the real world is everything but simple, and nothing is certain. This is difficult for us western-educated people to understand, I also strife for simplicity and clarity. Certainty

Figure 89. A hanging glacier at Mt. Jungfrau, Switzerland

in the urbanistic practice may stem from its architectural and engineering roots: As an architect one needs to have a clear concept, and present it with confidence. As an engineer one deals with cartesian geometries all the time in a positivist worldview. As designers aiming to design for a pluriversal world, one must embrace uncertainty and complexity. What is the point of making sense of it all, if "it all" doesn't make sense in the first place?

Taking the Water Garden and Refuturing frameworks as proposals, the real work begins here: to take this proposal to the actual human and non-human actors in the Lumnezia valley, to go out into the real world, and to expose oneself to it. A design with care makes the designer vulnerable, but also political, affectionate, and ethical.

Answering Research Questions

How can more-than-human communities in the Alps reclaim their agency under changing climatic and hydrological regimes through embracing water in the culture landscape to take an active role in their own refuturing, illustrated by the case study of the Lumnezia Valley, Switzerland?

SQ1) How can the Nature-human divide be bridged toward realizing distributed agencies among more-than-human communities?

The Nature–human divide, long central to Western epistemologies, proves inadequate in the context of the Alps—where landscapes are already co-produced through deeply entangled human and non-human relations. Alpine farmers, for instance, often describe themselves not as managers of Nature, but as partners or even subordinates to it. Their everyday practices are guided by seasonal rhythms, local ecological knowledge, and relational dependencies that embody an ethic of coexistence. This understanding resonates with the concept of natureculture (Haraway), which recognizes that all cultural landscapes—including the Alpine culture landscape—are hybrid formations shaped by both natural forces and human labour.

In this framework, agency is distributed, not fixed within humans. The Alps themselves—particularly through the dynamic presence of water—exemplify what have been called agentic landscapes: spaces where more-than-human actors actively shape ecological and social realities. To conceptualize this co-agency, the Parliament of Things (Latour) offers a productive lens. It can be understood both as a speculative institutional model and as an ethics of cohabitation, wherein humans and non-humans recognize, respond to, and negotiate with one another's presence and influence.

This shift requires that human actors let go of sole authorship and begin to make affordances for the agency of others—starting with recognition. Earth jurisprudence and the Rights of Nature represent legal mechanisms to formalize this, but everyday, material practices of care (Puig de la Bellacasa) are equally crucial. In many cases, they are prerequisites: forms of attunement and reciprocity that legal structures must follow, not precede. Gardening, understood as a relational, collaborative act between humans and the Earth, offers a tangible and grounded method to prototype such co-agency.

Bridging the Nature–human divide thus begins not with policy, but with presence: physical exposure, multispecies touch, and a reactivation of sensory and ethical attention. As Puig de la Bellacasa suggests, care emerges through touch. Designing such encounters can lay the groundwork for rethinking agency and responsibility—not as human burdens, but as shared capacities.

SQ2) What are the plain and hidden processes of (de)futuring and (de)territorialization of the Alpine Territory and the Lumnezia valley?

The plain processes of defuturing and deterritorialization in the Lumnezia valley reflect broader transformations across the Alpine region: the intensification of agriculture, the consolidation of farmland, and the infrastructural development for winter and summer tourism. These shifts are visible in the changing land-use patterns, the disappearance of small-scale plots, and the dominance of meadows treated primarily as calorie-producing surfaces. Marketing images—such as the iconic cow on green pastures—reinforce a curated vision of tradition and sustainability, even as underlying systems increasingly prioritize volume, throughput, and efficiency.

Hidden processes of defuturing operate more subtly, yet no less powerfully. These include the erasure of place-names through land consolidation, the

loss of ecological diversity through over-fertilization and frequent mowing, and the hydrological transformations of the landscape—such as the drainage of small wetlands or the destabilization of soils through altered water cycles. At the same time, deterritorialization is not only imposed from above; it emerges from material shifts—ground movement, erosion, species loss—that gradually unmoor long-established socio-ecological relations.

There are also emergent processes of refuturing and reterritorialization. These include the maintenance of traditional grazing rhythms, the persistence of marginalized wetland ecologies, and the everyday acts of care by farmers, conservationists, and soil organisms. Mapping these stories, through thematic narratives, actor-network diagrams, and seasonal cyclesm, reveals a landscape that is not singular, but a mosaic of overlapping temporalities, agents, and ways of knowing. The territory is thus both being undone and remade - often simultaneously - through visible policies and invisible metabolisms.

SQ3) Which actors and processes co-construct the water culture landscape?

The water culture landscape of Lumnezia is co-constructed by a broad constellation of human and nonhuman actors, operating through layered and seasonally shifting processes. Water itself is an agent—both as flowing surface water, shaping erosion and availability, and as groundwater, slowly moving beneath moraine layers, nourishing wetlands and vegetation. Wetland plants, grasses, and soil organisms respond to and influence water retention and distribution, often in interdependent cycles of decay, growth, and nutrient transfer.

On the human side, farmers play a central role: through grazing schedules, cutting regimes, and fertilization practices, they shape how water moves and accumulates in the landscape. Local government, as landowner and regulator, influences which areas are preserved, drained, or developed. Tourism operators—especially the ski resort—contribute through the physical shaping of slopes and infrastructure, affecting both surface runoff and snow melt patterns. Conservation groups, researchers, and artists introduce alternative narratives and interventions, often acting as advocates or translators for the nonhuman actors.

These interactions unfold across temporal and spatial scales. In high-alpine zones, communal grazing systems rely on water availability during summer months and leave the land to rest in winter, maintaining ecological balance. In mid-slope wetlands, seasonal saturation and drying govern which species survive and how soil structures change. Actor-network mappings and seasonal diagrams reveal how this landscape is not merely shaped by water, but also shapes cultural practices, territorial organization, and more-than-human solidarities. In this sense, the water culture landscape is not a product, but an ongoing negotiation - one where care, pressure, and adaptation converge.

SQ4) How can urbanists and designers set a framework for pluriversal autonomous design toward sustainment in the Alps?

To set a framework for pluriversal autonomous design in the Alps, urbanists must first reject the illusion of control. Instead of imposing top-down visions, they must cultivate conditions in which emergence becomes a central design process—not as a byproduct, but as a fundamental mode of working. In this view, design is not the act of shaping matter into form, but the invitation for new relationships, rhythms, and meanings to come together over time.
In the Water Garden and the Refuturing framework, emergence is not simply an aesthetic or ecological outcome - it is an ontological condition. The garden is not just an artifact; it is a living, situated culture of co-habitation and co-survival, translating interdependency into intra-dependency - where actors no longer just coexist, but shape one another. The garden evolves through repeated gestures of care, adaptation, observation, and negotiation. It becomes a site where design and territory co-emerge through time, labour, and affect.

Urbanists working toward sustainment must therefore shift from designing for a community or landscape, to designing with and within it. This means building frameworks - not blueprints - that amplify existing practices, connect dispersed knowledge, and hold space for difference. The urbanist's role is not to prescribe solutions, but to curate a set of generative conditions: scaffolding emergence, holding contradictions, and facilitating long-term reciprocity across species, scales, and temporalities.

Pluriversal design insists on a multiplicity of worlds - many ways of knowing, making, and caring. It recognizes the Alps not as a single landscape, but as a mosaic of lifeworlds: historical, ecological, mythological, economic, and spiritual. Autonomous design in this context does not mean retreat into isolation, but sovereignty in relation - each place shaping its own becoming, in dialogue with others, human and more-than-human alike.

This approach is both conceptual and practical. The Water Garden, with its bodily, landscape, and regional scales, offers a situated and testable model for this framework. It translates ontologies of care into tasks of maintenance and affection; multispecies commons into shared governance and stewardship; and alternative modes of exchange into community economies based on time, labour, and reciprocity. It is a structure for emergent autonomy, not a template for replication.

The designer, then, becomes a participant among many: a noticer, a translator, a convener, a co-gardener. Walking-with becomes not just a metaphor, but a methodology - one that demands ethical presence, temporal patience, and radical openness to uncertainty. To design in this way is not to master the landscape, but to enter into a dialogue with its complexity.

In conclusion, urbanists and designers can set a framework for pluriversal autonomous design toward sustainment in the Alps by:

- Embracing emergence as a guiding process of co-evolution, not control.
- Scaffolding frameworks that allow diverse actors—human and non-human—to co-create futures.
- Working trans-scalar and trans-temporal, acknowledging that deep shifts happen slowly and across networks of care.
- Decentering the designer, who acts not as a visionary but as an attentive co-creator.
- And by walking-with the land and its lifeworlds—sensing, adapting, and staying-with.

Main Research Question

How can more-than-human communities in the Alps reclaim their agency under changing climatic and hydrological regimes through embracing water in the culture landscape to take an active role in their own refuturing, illustrated by the case study of the Lumnezia Valley, Switzerland?

More-than-human communities in the Alps can reclaim agency by co-producing adaptive and emergent territorial futures through relational frameworks rooted in care, commons, and exchange. Urbanists and designers contribute by walking-with these communities—recognizing distributed agency, mapping defuturing and deterritorialization, and setting conditions for pluriversal, autonomous, and water-attuned practices of refuturing.

At the heart of this process lies the culture landscape—as a living, co-constructed terrain shaped over centuries through the entanglement of ecological processes, cultural practices, and seasonal rhythms. The Alpine culture landscape is the result of mutual shaping between humans and their environment. These practices form a memory encoded in soils, infrastructures, and social structures. Crucially, they also include the more-than-human actors—all of which actively participate in shaping the land.

Reclaiming agency within the culture landscape means restoring its capacity for response and adaptation, by opening it to new configurations rooted in situated ethics: reciprocity, stewardship, seasonal attunement. As climate change destabilizes long-held socio-ecological balances, the culture landscape can evolve—not through abandonment or technocratic management, but through collaborative care, sensitive experimentation, and slow, attentive design.

Within this culture landscape, water emerges as both a territorial agent and a symbolic figure of interconnection. Water is never neutral; it holds and transforms. It is carved into the Alpine landscape through glaciers, springs, streams, and wetlands—and itself carves the landscape. Water determines what grows, what erodes, what lingers, what returns. It is central to agriculture, tourism, tradition, and biodiversity. And its cycles are among the most dramatically impacted by climate change.

To embrace water in the culture landscape is to engage with it not as a resource to be captured or controlled, but as a partner in design—a medium for sustaining life, for reconnecting fragmented systems, for reimagining spatial practices. Water is the connector across scales: from the wet soil beneath one's feet, to the regional hydrological system that defines the Alps as the "water tower of Europe." It is also a temporal bridge, linking ancient glacial flows to future droughts, and tying human seasonalities to those of frogs, reeds, fungi, and clouds.

Reclaiming agency in the Alps is therefore not a matter of innovation, but of recognition, restoration, and imagination. It is a matter of returning to and amplifying that which is already sustaining, while co-creating new alignments between species, temporalities, and forms of knowing. Water, as a territorial and symbolic actor, becomes the conduit for this reconnection—binding soil to sky, culture to climate, and past to future.

Through careful, relational design, urbanists can help hold open space—not for fixed futures, but for shared, ongoing refuturing.
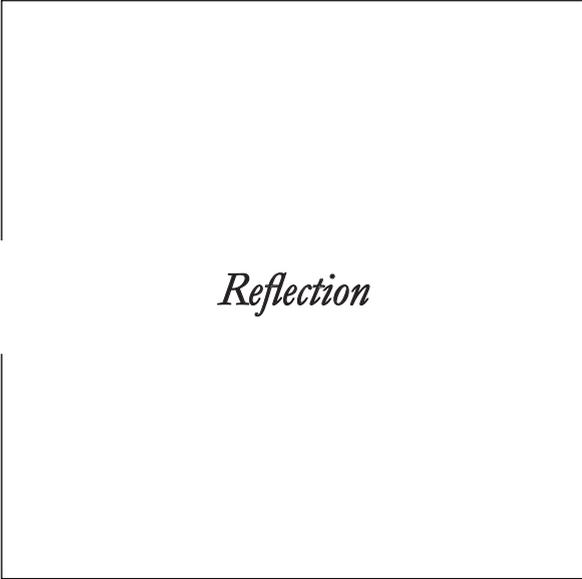
Reflection

At the time of writing, I spent the last eleven months investigating and relating to the Alps. As this journey with the mountains draws to a close, I feel a mixture of sadness, relief, and joy. Sadness in the sense of climate grief, the certainty that the world is turning into a graveyard for the many others, whose kinship we will truly miss only when they are gone. Relief in the knowledge that the world is infinitely more complicated than anyone can truly understand, and that the unending forces of life and death – Gaia – are there, always. And joy at the knowledge that there is a future, for the many humans and non-humans in the Lumnezia valley, the mountain dwellers, those of us who were, and those who are not yet.

As my journey continues, I will carry the seeds of concern and care for the valley and the mountains with me, personally, academically, professionally, emotionally. As I realized, last November while reading the academic literature to prepare my theoretical framing, the importance of positionality as a designer, I felt for the first time where this thesis might take me. That the designer I want to be is not just a job – in my mother tongue I would call it a Beruf, or Berufung – a calling. I don't believe in God, but am well aware of the significance of a calling, it is to me a matter of realizing the concern I carry into genuine care for the world, us, and others.

Throughout the thesis, I use the word situated a lot. Conceptually, situatedness can mean the involvement within a context, referring to the "involvement of the researcher within a research site" (Given, 2008). The design process takes place in particular situation, carried out from embedded positions (D. Haraway, 1988; Simonsen et al., 2014). Situatedness hints that design is always time-, actor-, process-, ethics-, and site-specific. To me, it also carries a more personal meaning: As a designer, I need to involve myself – embed myself – into a site, to be able to propose a design. This must happen physically, ethically, but also affectively. Only with with genuine care can I propose something. I am reminded of Joan Trontos definition of care: "a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, our selves, and our environment, all of which we seek to interweave in a complex, life-sustaining web." (Tronto, 1991). As a designer, I am part of the design I propose, I also live in the same world as the Lumnezia valley, the Alps, the wetlands, the others who I'll never know.

As my work on this thesis draws to a close, this work leaves me with so many things un-said, un-done. When starting the thesis, I started investigating in all directions, on a territory which has infinite facets. The biggest effort was to select out of this infinity a tiny set of concerns, investigations, actors, and methods, leaving so many things on the wayside. As it saddens me that I couldn't put everything I wanted into this thesis, I do feel satisfied with the general path I took. Rationalism and the scientific method aim to reduce complexity, and I tried to resist this reductionism as well as possible, drawing as big a circle as I could manage in the narrow bounds of a thesis in an university environment. So, even if this document approaches 200 pages and almost 30000 words, rest assured that behind each word stand hundreds, which remain outside the margins of this work. Dear reader, each of those words invites you to think beyond them. Your interpretation of what I produced and your imagination, creativity, and criticality should be as much a part of this thesis as my own.

Relevance

Academic Relevance

In Part I of the thesis, I situated this work within theories and concepts broadly revolving around relational ontologies. Centring the parliament of things as the conceptual framework for a different viewpoint of space is not a new things per se. but an approach which still exists on the margins of urbanism. Moreover, the conceptualization of design as futuring, and Tony Fry's call for sustainment instead of sustainability are also still a fringe in the practice of producing space – at least from my perspective as a student.

Through the design of the water garden, I attempted to move beyond theory and use this space as a testbed for negotiating more-than-human entanglements. Attuned to Maria Puig de la Bellacasas Matters of Care (2017). And connecting to Anna Tsings Art of Noticing (2015), the garden became a way to attend to and interact with non-humans as actors, partners, and co-designers, fellow gardeners in the planetary garden of earth (referencing Gilles Clément (2015)). In doing so, I aimed to explore urbanism and design as relationship-building grounded in care, slowness, and material reciprocity. And this is possibly the main contribution of the thesis, as an exploration

of these concepts in design and thus furthering the understanding of design practice.

This exploration inevitably led me to engage with the contested concepts of landscape and territory. Landscape, in the context of this project, resisted a singular description. The pluriversal view upon landscape, shaped by Arturo Escobar's Designs for the Pluriverse (2018b) as the radical interdependence between actors and processes, lead me to the mapping approaches by Frédérique Aït-Touati, Alexandra Arènes, and Axelle Grégoire in Terra Forma (2022), ultimately seeing the landscape as a co-constructed space, continually engaged in it's re-making. This is also evident in practice, as everyone has a different view upon the landscape, and it takes great effort just to see these different viewpoints. In chapter 3 I tried to explore this multiplicity, taking help from Ian McHargs Design with Nature (1969).

Meanwhile, I had a more structured approach with the term territory, basing myself a lot on Claude Raffestin (2012) as a project produced through labour and symbols, which allowed me to frame the water garden also as an act of territorialization through care. Acts of maintenance, rituals, and repair which I took from the traditional culture landscape made this act also an act of refuturing.

Taking the traditional values and conceptualization of Nature and landscape, I realized that concepts like Natureculture, Gaia, agentic landscapes and so on are (or have been) living practice in the Alps already. Decolonial theory and urban studies proved to give me a better understanding of these situated knowledges, and how to position myself among them. In doing so, I had to negotiate around the term indigenous, a contested term as well, often used to describe these situated practices and knowledges. Indigenous, as a global term however, is very loaded with colonial power structures, western imperialism, and the struggles of many native and enslaved peoples around the world. Applying indigenous on European soil is thus somewhat marginalizing this aspect of the term. Instead I used the term situated knowledge as a differentiator to universalist knowledge, understanding that even in Europe, not everyone shares the same view upon knowledge. There is a distinction between academic and lived knowledge everywhere.

The ideas I wrote about in the previous paragraphs are, to some extent, already present in the urbanism discourse, albeit often on the margins. While modernist and technocratic, universalist and de-politicized discourses still dominate debates and pedagogy, a growing body of work in landscape urbanism, political ecology, and design anthropology resonate with these relational, decolonial, and more-than-human perspectives. My thesis contributes to this emergent field by providing a design-led experiment that attempts to translate these theoretical concepts into spatial projects, lived experiences, and design methodologies. In this sense I see my work as a provocation within urbanism, suggesting that design can and should be more than a functional or aesthetic act, it should become a form of ontological negotiation and a practice of care.

Relevance within the University

While my project exists somewhat on the margins of the wider urbanism profession, within my university TU Delft at the faculty of Architecture, the master track Urbanism, and the studio Transitional Territories it is somewhat more centred. The theme of our design studio is "Altered Nature – Poetics of Chage". It is connected to the notion of the Anthropocene, the totalizing design power of the planet by human processes. The Anthropocene provided the conceptual starting point for exploring the Alpine space, the studio name encouraged me to think about the Alps as a territory.

The lectures by our tutors, professors and guests from other universities as well as professionals, and my mentors Luisa Calabrese and Nikos Katsikis, introduced a lot of the topics I based my concepts around. In this sense, My contribution is to an ongoing discussion within our studio of seeing urbanization processes beyond city limits, exploring urbanism and design on a territorial level, and experimenting with alternative approaches to our discipline, in a transdisciplinary manner. Negotiating disperate fields such as visual arts, environmental engineering, sociology, economics, and landscape architecture with urban design on an extended scale is a difficult design tasks. Naturally, this leads to a broad range of approaches and creative applications of theory, and often to a somewhat messy methodology and surprising results. But it is the experimentation, encouraged by the studio and the faculty, which allows alternative and important positions to emerge.

Socio-ecological Relevance

While academic exploration and deliberation are important contributions, the issues threatening the Alpine territory, the Lumnezia valley, the humans living within, and the countless non-humans comprising the landscape, are real, and they are urgent. Seeing them through the lens of defuturing and deterritorialization, with a relational perspective, has first and foremost reinforced this urgency, and it has conceptualized the growing awareness and concern among communities in the Alps. To bridge the gap between academic discourse and lived realities, I formulated the design intervention as a garden: a widely used concept. Connecting the water garden to the culture landscape, I aimed to further integrate the design within the existing histories and conceptualizations of the land.

Everyone who I interviewed during my fieldtrips expressed concerns about or hopes for the future, individual and collective, the future of the ecosystems and for the valley and Alps as a whole. The people in the valley have relationships with the Nature that surrounds them, directly in their practice and indirectly in their sense of place, identity, and heritage. This is a valuable energy which needs to be harnessed by designs for the valley. But too often, the designs have been very technocratic and are now eroding in their function (ski lifts, power stations) or are eroding their environment (intensive agriculture etc.). My proposition of the water garden aims to harness the energy and concerns of the community, while situating it differently within the existing landscape as an act of ecological restoration, reconfiguration of the technocratic infrastructures, and relational densification.

Intuitively, the project makes sense. This is the most important aspect that can help the project to contribute to the socio-ecological networks of people, culture, and Nature. Natureculture as a concept seems complicated, until you talk to an alpine farmer about their relationship with Nature. Presenting my project to the people of Lumnezia, they might not understand all the jargon or the concepts, but I am sure there are many connection points to their own lived experiences, desires, and concerns. A sense of stewardship, if not partnership, toward Nature already exists, it is a matter of reinvigorating this sense, as it is now somewhat stunned through the ongoing disconnection from the land and Nature in modern capitalism and urbanization.

Limitations

The root causes of the urgencies I approach are Anthropogenic climate change, caused by industrialization and enforced by capitalism, urbanization and infrastructure development, neo-liberalism and the selling-out of democracies, which I mentioned in the introduction on page 23. The designs proposed in this thesis don't address these root causes directly. They are very large, wicked problems, and the remedies against them are not found entirely within the realm of urbanism (as flexible though as it may be). I don't believe everything I do has to solve all the root problems. But not addressing them at least in positioning oneself in relation to them runs the risk of belittling them. This thesis is not supposed to be an uncritical acceptance of climate change, neo-liberalism, or capitalism just as a fact, and I am not entirely certain that I made this fact clear.

As to the content of the thesis, the most limiting factor to its creation was time. Now that I am finishing the master thesis, I realize many areas I want to develop further. In the philosophy of a generalist practice rather than a specialist one, the thesis touches many topics, while only delving into a few of them. Among the many holes in the thesis, there is one big one: What does co-creation mean in practice?

This is an academic project. Apart from a few fieldtrips to the site, the most time was spent indoors, outside of the project area (or even the Alps), behind a desk. Designing for the real world in my opinion has to happen in the real world, especially when the theme is on the construction of futures as a relational practice. This is all to say that the entire thesis is based on the assumption, that it will hold, if confronted with the actual people, non-humans, and landscapes of the Lumnezia valley.

Apart from this common issue with academic work, smaller, but nevertheless important limitations are the lack of the local language Romonsh, which could have unlocked deeper knowledge of the site. The availability of data, especially on the biophysical and ecological conditions of the site, as well as the knowledge to interpret those data, could unlock more precise design decisions which can consider the specifics of the site and potential impacts of usage, climate change, and extreme weather events. The inclusion of more diverse voices of the region could deliver more nuanced local perspectives, although over the course of the fieldtrips, I did talk to around a dozen local people in depth, and I am fairly confident in my perception of the Lumnezia valley. Finally, a more in-depth classical stakeholder review can uncover dangers and potentials toward real-world applicability: maybe an important actor already has other designs, in that case the thesis would need to be adapted substantially.

The aim of this thesis was not to provide concrete spatial answers to the urgencies of the valley and the Alps. It is to propose speculative futures for the region, with the intent to spark a conversation about refuturing. "Ideas are best discussed when they are visual" Thomas Kissling told me during an expert interview. Then it is possible to create movement toward change, even if the presented idea is fantastical or utopian, it is the ensuing discussion that can prove fruitful.

Transferrability and Future Research

As I wrote many times, design needs to be situated and designers need to embed themselves into a site, to be able to propose something meaningful. So the design itself is difficult to transplant to other geographies. It is in the conceptual framework, the method, and the framework for adaptive futures which can be transferred to other places. Seeing urbanism as a practice of building relations, of maintenance and care toward a complex web of life, this is the potential to take to other sites.

To expand on the conceptual framework, the approaches and the speculative refuturing method can help this design concept. But its real world capabilities need to be tested. Fieldwork – as in working with the concept of autonomous design in the field – is the best way to generate knowledge about the method. Knowledge exchange with other practitioners of this method, too, is important. As I wrote earlier, urbanism and design become culture, and culture doesn't behave predictably.
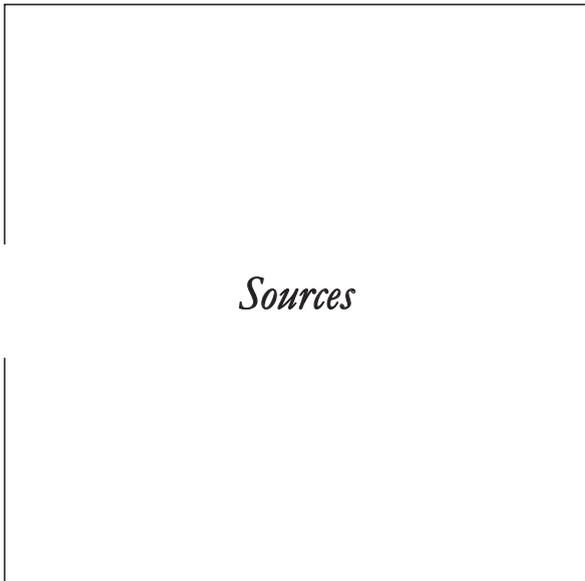
Sources

Image Sources

Figure 40 on page 109: Annual Rhythms

Albin, M., (n.d.). Mario Albin, Käser. Retrieved 21. May 2025, from https://cascharia-kaeserei-lumbrein.ch/kaser-signun/

Wirestock (n.d.) Vertikale Aufnahme von Kühen, die unter einem bewölkten Himmel herumlaufen. Retrieved 21. May 2025, from https://de.freepik.com/fotos-kostenlos/vertikale-aufnahme-von-kuehen-die-unter-einem-bewoelkten-himmel-herumlaufen_13382394.htm

Wirestock (n.d.) Wanderer mit einem Rucksack, der auf dem Gipfel des Berges steht. Retrieved 21. May 2025, from https://de.freepik.com/fotos-kostenlos/wanderer-mit-einem-rucksack-der-auf-dem-gipfel-des-berges-steht_24345376.htm

Wirestock (n.d.). Flacher Winkelschuss einer Person, die auf einer Seilbahn in einem schneebedeckten Berg sitzt. Retrieved 21. May 2025, from https://de.freepik.com/fotos-kostenlos/flacher-winkelschuss-einer-person-die-auf-einer-seilbahn-in-einem-schneebedeckten-berg-sitzt_9990484.htm

Figure 72 on page 170 and Figure 73 on page 172: Design for hydrological resilience as a goal for refuturing

Conti, F. (2018). Aerial view of river and grassland. Unsplash. Retrieved 4. June 2025, from https://unsplash.com/photos/aerial-view-of-river-and-grassland-sm_aWbUDITg

Crump, M. (2018). Body of water between rock formation at daytime. Unsplash. Retrieved 4. June 2025, from https://unsplash.com/photos/body-of-water-between-rock-formation-at-daytime-EzpVvIrL-Xw

Fine_plan (2013). Matanuska Glacier. Flickr. Retrieved 4. June 2025, from https://www.flickr.com/photos/fineplan/9044838493/

Hoehenrausch.de (n.D.) Junger Steinadler mit weisser Zeichnung. Retrieved 6. June 2025, from https://www.hoehenrausch.de/tierlexikon/steinadler/

Hudson, J. (2022). A house on a hill. Unsplash. Retrieved 6. June 2025, from https://unsplash.com/photos/a-house-on-a-hill-721rOgD8Du4

Morgen, S. (2019). Glaciologists measuring the rate of movement on the Kangerlussuaq glacier, Greenland. Retrieved 6. June 2025, from https://www.carbonbrief.org/factcheck-what-greenland-ice-cores-say-about-past-and-present-climate-change/

Muzammil Graphix (n.d.) Glass of water in female hand isolated on white background with clipping path. Vecteezy. Retrieved 4. June 2025, from https://www.vecteezy.com/photo/26794103-glass-of-water-in-female-hand-isolated-on-white-background-with-clipping-path

Pngtree (n.d.) Animal Earthworm On White Background Animal. Retrieved 6. June 2025, from https://pngtree.com/freepng/animal-earthworm-on-white-background-animal_13516507.html

Soilsensor. (n.d.). Soil Horizons. Retrieved 6. June 2025, from https://soilsensor.com/articles/soil-horizons/

Tardigrades (n.d.). what's the deal with tardigrades? Retrieved 6. June 2025, from https://dtc-wsuv.org/apalisson21/narrative/

Vas (2016). Butterflies in Flight. Birds in Backyards. Retrieved 6. June 2025, from https://www.birdsinbackyards.net/forum/Butterflies-Flight

Figure 72 on page 170 and Figure 74 on page 174: Design for multispecies care as a goal for refuturing

Extension (n.d.). About Soils. Retrieved 14. June 2025, from https://www.aces.edu/blog/topics/healthy-soils/about-soils/

Kerrison, M. (2022). Inspiring English wildflower meadows you can visit. Retrieved 14. June 2025, from https://www.houseandgarden.co.uk/article/wildflower-meadows-to-visit

Maishofen. (2012). Dorffest Maishofen 2012. Retrieved 14. June 2025, from https://www.maishofen.com/en/saalbach-zell-am-see/region-city/dorffest-maishofen-2012-kopie.html

Rudolf, V. H. W. (n.d.) Volker H W Rudolf's Lab. Retrieved 14. June 2025, from https://www.researchgate.net/lab/Volker-H-W-Rudolf-Lab

Vwalakte (n.d.) Portrait of black and white cow on green grass and blue sky. Retrieved 14. June 2025, from https://www.freepik.com/free-photo/portrait-black-white-cow-green-grass-blue-sky_10585703.htm

Figure 72 on page 170 and Figure 75 on page 176: Design for regenerative economics as a goal for refuturing

Lid. (2020). Weltmeistertitel für Schweizer Käser. Retrieved 14. June 2025, from https://www.bauernzeitung.ch/artikel/markt-preise/weltmeistertitel-fuer-schweizer-kaeser-359359

McDonald, E. (n.d.) Cute baby goat photos, videos, and facts. Retrieved 14. June 2025, from https://animalhype.com/mammals/baby-goat/

Ruis, R. (2025). Wie früher: Mit Maultieren und Käse über Alpenpässe wandern, Retrieved 14. June 2025, from: https://www.tagesanzeiger.ch/kaesewandern-unterwegs-auf-der-sbrinz-route-248614449371

Schat, K. (2020). Wish I knew before milking cow. Retrieved 14. June 2025, from https://venisonfordinner.com/wish-i-knew-before-milking-cow/

Zeilinger, E. (2016). Einkaufsgemeinschaft stärkt Region. Retrieved 14. June 2025, from https://www.tips.at/nachrichten/allhaming/wirtschaft-politik/374839-einkaufsgemeinschaft-staerkt-region

Bibliography

Aït-Touati, F., Arènes, A., & Grégoire, A. (2022). Terra Forma. A Book of Speculative Maps. The MIT Press.

Altwegg, J., & Tieber, S. (n.d.). Migranten – Schweizer Amerikawanderung des 19. Jahrhunderts | Sozialgeschichte. Retrieved 13 May 2025, from https://www.sozialgeschichte.ch/themen/schweizer-amerikawanderung-des-19-jahrhunderts/

Alves, F., Costa, P. M., Novelli, L., & Vidal, D. G. (2023). The rights of nature and the human right to nature: An overview of the European legal system and challenges for the ecological transition. Frontiers in Environmental Science, 11. https://doi.org/10.3389/fenvs.2023.1175143

ARTEde (Director). (2025, April 19). Von der Großstadt auf die Alm | ARTE Re: [Video recording]. https://www.youtube.com/watch?v=3q_QGHRXXbE

Bathla, N. (Ed.). (2024). Researching Otherwise: Pluriversal Methodologies for Landscape and Urban Studies. gta Verlag, ETH Zürich. https://doi.org/10.54872/gta/4692

Bausch, T., & Gartner, W. C. (2020). Winter tourism in the European Alps: Is a new paradigm needed? Journal of Outdoor Recreation and Tourism, 31, 100297. https://doi.org/10.1016/j.jort.2020.100297

Biodiversity & Nature Conservation. (n.d.). Alpconv. Retrieved 17 January 2025, from https://www.alpconv.org/en/home/topics/biodiversity-nature-conservation/

Biosphäre Entlebuch. (n.d.). Aufbau der Biosphäre | UNESCO Biosphäre Entlebuch. Retrieved 12 May 2025, from https://www.biosphaere.ch/de/biosphaere/portrait/biosphaere-was-ist-das

Bonnedahl, K. J., & Heikkurinen, P. (Eds.). (2018). Strongly Sustainable Societies: Organising Human Activities on a Hot and Full Earth. Routledge. https://doi.org/10.4324/9781351173643

Brenner, N. J. (Ed.). (2014). Implosions /Explosions: Towards a Study of Planetary Urbanization (1st edition). JOVIS.

Brons, R. (2019, April 9). Reframing Care—Reading María Puig de la Bellacasa 'Matters of Care Speculative Ethics in More Than Human Worlds'. Ethics of Care. https://ethicsofcare.org/reframing-care-reading-maria-puig-de-la-bellacasa-matters-of-care-speculative-ethics-in-more-than-human-worlds/

Bundesamt für Statistik. (2022). Fremdenverkehrsbilanz (inq–91–fvb–de) [Dataset]. Bundesamt für Statistik. https://www.bfs.admin.ch/bfs/de/home/statistiken/tourismus/erhebungen/fvb.html

Bundesgesetz Über Die Raumplanung, SR 700, Die Bundesversammlung der Schweizerischen Eidgenossenschaft (2019).

Bundi, M. (1982). Zur Besiedlungs- und Wirtschaftsgeschichte Graubündens im Mittelalter. Calven-Verlag.

Cabalzar, M. (2024). Lumnezia. Flurnamen und Sagen, Geschichte und Kultur. Fundaziun da cultura Lumnezia.

Cadaval Narezo, M., Méndez Torres, G., Hernández Vásquez, A., & Castro-Sotomayor, J. (2023). Contributions to the pluriverse from indigenous women professors of intercultural universities. Globalizations, 20(7), 1144–1162. https://doi.org/10.1080/14747731.2023.2193546

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P. W., Trisos, C., Romero, J., Aldunce, P., Barrett, K., Blanco, G., Cheung, W. W. L., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C., … Péan, C. (2023). IPCC, 2023: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. (First). Intergovernmental Panel on Climate Change (IPCC). https://doi.org/10.59327/IPCC/AR6-9789291691647

Capt, S. (2022). Rote Liste der Säugetiere (ohne Fledermäuse). Gefährdete Arten der Schweiz. (Umwelt-Vollzug). Bundesamt für Umwelt (BAFU); info fauna (CSCF).

Cardini, P., & Wang, I. V. (2024). ReFuturing: New Prompts for New Ecological Visions. In R. B. Egenhoefer, Routledge handbook of sustainable design (Second edition, 1–1 online resource (xvii, 643 pages) : illustrations, pp. 541–556). Routledge. https://www.taylorfrancis.com/books/9781003365433

Casale, F., & Bocchiola, D. (2022). Climate Change Effects upon Pasture in the Alps: The Case of Valtellina Valley, Italy. Climate, 10(11), Article 11. https://doi.org/10.3390/cli10110173

Chand, R., & Leimgruber, W. (Eds.). (2016). Globalization and Marginalization in Mountain Regions (Vol. 1). Springer International Publishing. https://doi.org/10.1007/978-3-319-32649-8

Chapman, M., & and Deplazes-Zemp, A. (2024). Moving beyond stewardship to partnership with nature: How Swiss alpine farmers' relationships to nature and relational values are co-constituted. Ecosystems and People, 20(1), 2374757. https://doi.org/10.1080/26395916.2024.2374757

CIPRA. (2012). Climate change: Why the Alps are particularly affected. CIPRA. https://www.cipra.org/en/cipra/international/projects/completed/cc-alps/about/climate-change-alps

Clément, G. (n.d.). Concepts. Retrieved 12 May 2025, from https://www.gillesclement.com/index.php

Clément, G. (2015). 'The Planetary Garden' and Other Writings. University of Pennsylvania Press.

Clément, G. (2021, February 16). In practice: Gilles Clément on the planetary garden. The Architectural Review. https://www.architectural-review.com/essays/in-practice/in-practice-gilles-clement-on-the-planetary-garden

Corradini, P., Omizzolo, A., Rizzari, M., Corrado, F., Durbiano, E., La Riccia, L., Santoro, G., Nenert, B., Notarnicola, C., Crespi, A., Bertoldi, G., Tonelli, C., & Prèmier, V. (2023). Report on the effects of Climate Change on the Alpine Space Snow Tourism Destinations. https://iris.polito.it/handle/11583/2994755

Coward, M., & Dietrich, D. (1989). Alpine tectonics—An overview. Geological Society, London, Special Publications, 45(1), 1–29. https://doi.org/10.1144/GSL.SP.1989.045.01.01

CREA Mont-Blanc. (n.d.). Climate change and its impacts in the Alps | CREA Mont-Blanc. Retrieved 4 December 2024, from https://creamontblanc.org/en/climate-change-and-its-impacts-alps/

Cullinan, C. (2011). Wild Law: A Manifesto for Earth Justice. Green Books.

Dal Zilio, L., Kissling, E., Gerya, T., & van Dinther, Y. (2020). Slab Rollback Orogeny Model: A Test of Concept. Geophysical Research Letters, 47(18), 1–10. https://doi.org/10.1029/2020GL089917

Das Laboratorium des Fortschritts: Die Schweiz im 19. Jahrhundert (2. revidierte Auflage) (with Jung, J.). (2020). NZZ libro, Schwabe Verlagsgruppe AG.

De La Bellacasa, M. P. (2017). Matters of Care: Speculative Ethics in More than Human Worlds. University of Minnesota Press. https://www.jstor.org/stable/10.5749/j.ctt1mmfspt

Dewey, J. F., Helman, M. L., Knott, S. D., Turco, E., & Hutton, D. H. W. (1989). Kinematics of the western Mediterranean. Geological Society, London, Special Publications, 45(1), 265–283. https://doi.org/10.1144/GSL.SP.1989.045.01.15

Diener, R., Herzog, J., Meili, M., Meuron, P. de, & Schmid, C. (2005). Switzerland – an Urban Portrait: Vol. 1: Introduction; Vol. 2: Borders, Communes – a Brief History of the Territory; Vol. 3: Materials. Birkhäuser. https://doi.org/10.1515/9783034608664

Dombroski, K. (2020). Caring labour: Redistributing care work. In J. K. Gibson-Graham & K. Dombroski, The Handbook of Diverse Economies (pp. 154–162). Edward Elgar Publishing.

Dürbeck, G., Schaumann, C., & Sullivan, H. I. (2015). Human and Non-Human Agencies in the Anthropocene. 6(1).

Elden, S. (2010). Land, terrain, territory. Progress in Human Geography, 34(6), 799–817. https://doi.org/10.1177/0309132510362603

Elmi, M. (Ed.). (2018). The Alps in 25 Maps. Permanent

Secretariat of the Alpine Convention.

Elsasser, H., & Messerli, P. (2001). The Vulnerability of the Snow Industry in the Swiss Alps on JSTOR. Mountain Research and Development, 21(4), 335–339.

Escobar, A. (2018a). Autonomous design and the emergent transnational critical design studies field. Strategic Design Research Journal, 11(2), 139–146. https://doi.org/10.4013/sdrj.2018.112.10

Escobar, A. (2018b). Designs for the Pluriverse. Radical Interdependence, Autonomy, and the Making of Worlds. Duke University Press.

European Environment Agency. (2009). Regional climate change and adaptation: The Alps facing the challenge of changing water resources. Publications Office. https://data.europa.eu/doi/10.2800/12552

Ferrari, M., Pasqual, E., & Bagnato, A. (2019). A Moving Border: Alpine Cartographies of Climate Change. Columbia Books on Architecture and the City.

Flury, C., Huber, R., & Tasser, E. (2013). Future of Mountain Agriculture in the Alps. In S. Mann (Ed.), The Future of Mountain Agriculture (pp. 105–126). Springer. https://doi.org/10.1007/978-3-642-33584-6_8

Friess, D. A., & and Jazeel, T. (2017). Unlearning "Landscape". Annals of the American Association of Geographers, 107(1), 14–21. https://doi.org/10.1080/24694452.2016.1230414

Fry, T. (2003). The Voice of Sustainment: An Introduction. Design Philosophy Papers, 1(1), 41–48. http://dx.doi.org/10.2752/144871303X13965299301515

Fry, T. (2019). Design futuring in a borderland of postdevelopment. In Postdevelopment in Practice. Routledge.

Fry, T. (2020). Defuturing: A New Design Philosophy. Bloomsbury Publishing.

Gatti, M. (2024). Was die Schweiz von den Niederlanden lernen kann. https://raumkonzept-schweiz.ch/bibliothek/schweiz-niederlande

Gilck, F., & Poschlod, P. (2019). The origin of alpine farming: A review of archaeological, linguistic and archaeobotanical studies in the Alps. The Holocene, 29(9), 1503–1511. https://doi.org/10.1177/0959683619854511

Given, L. M. (2008). Situatedness. In L. M. Given (Ed.), The SAGE Encyclopedia of Qualitative Research Methods. https://doi.org/10.4135/9781412963909.n424

Grass, N. (1988). Vieh-und Käseexport aus der Schweiz in angrenzende Alpenländer besonders im 16. Und 17. Jahrhundert. Rotten-Verlag.

Grêt-Regamey, A. (2020). Was heissen Planung und Raumentwicklung? Begriffe, Definitionen u. Prinzipien der Raumentwicklung [Lecture]. Raum- und Landschaftsentwicklung GZ, ETH Zurich.

Hakala, U., Sjöblom, P., & Kantola, S.-P. (2015). Toponyms as carriers of heritage: Implications for place branding. Journal of Product & Brand Management, 24(3), 263–275. https://doi.org/10.1108/JPBM-05-2014-0612

Haldrup, M., Samson, K., & Laurien, T. (2022). Designing for Multispecies Commons: Ecologies and Collaborations in Participatory Design. Proceedings of the Participatory Design Conference 2022 - Volume 2, 14–19. https://doi.org/10.1145/3537797.3537801

Hangmoor. (n.d.). Retrieved 10 May 2025, from https://www.spektrum.de/lexikon/geowissenschaften/hangmoor/6685

Haraway, D. (1988). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. Feminist Studies, 14(3), 575–599. https://doi.org/10.2307/3178066

Haraway, D. J. (2003). The Companion Species Manifesto: Dogs, People, and Significant Otherness. Prickly Paradigm Press. https://press.uchicago.edu/ucp/books/book/distributed/C/bo3645022.html

Haraway, D. J. (2016). Staying with the Trouble: Making Kin in the Chthulucene. Duke University Press. https://doi.org/10.1215/9780822373780

Haraway, D. J. (with Internet Archive). (1991). Simians, cyborgs, and women: The reinvention of nature. New York : Routledge. http://archive.org/details/simianscyborgswo0000hara

Harbers, H. (1995). [Review of Review of We Have Never Been Modern, by B. Latour]. Science, Technology, & Human Values, 20(2), 270–275.

Hertach, T. (2021). Rote Liste der Singzikaden. Gefährdete Arten der Schweiz. Bundesamt für Umwelt (BAFU), info fauna (CSCF).

Hill, M., Wallner, A., & Furtado, J. (2010). Reducing vulnerability to climate change in the Swiss Alps: A study of adaptive planning. Climate Policy, 10(1), 70–86. https://doi.org/10.3763/cpol.2008.0536

Hirst, K. (2018). What Were the Global Effects of Ice Covering So Much of Our Planet? ThoughtCo. https://www.thoughtco.com/last-glacial-maximum-end-of-ice-age-171523

Hood, J. L., & Hayashi, M. (2015). Characterization of snowmelt flux and groundwater storage in an alpine headwater basin. Journal of Hydrology, 521, 482–497. https://doi.org/10.1016/j.jhydrol.2014.12.041

Huber, C. J., Eichler, A., Mattea, E., Brütsch, S., Jenk, T. M., Gabrieli, J., Barbante, C., & Schwikowski, M. (2024). High-altitude glacier archives lost due to climate change-related melting. Nature Geoscience, 17(2), 110–113. https://doi.org/10.1038/s41561-023-01366-1

John, N. S., & Akama, Y. (2021). Reimagining co-design on Country as a relational and transformational practice. CoDesign, 18(1), 16.

Kauffmann, C. (n.d.). Dashboard—Eco Jurisprudence Monitor. Eco Jurisprudence Monitor. Retrieved 18 January 2025, from https://ecojurisprudence.org/dashboard/?map-style=political

Kaufmann, S. (2020, December 10). Landwirtschaft in den Alpen. https://www.planet-wissen.de/natur/gebirge/alpen/pwielandwirtschaftindenalpen100.html

Kissling, T. (2021). Solid fluid biotic: Changing alpine landscapes. Lars Müller Publishers. https://eth.swisscovery.slsp.ch/discovery/fulldisplay?docid=alma991179 66408705503&context=L&vid=41SLSP_ ETH:ETH&lang=de&search_ scope=DiscoveryNetwork&adaptor= Local%20Search%20Engine&tab=discovery_ network&query=any,contains,solid%20fluid%20 biotic&offset=0

Klaus, G., Cordillot, F., & Künzle, I. (2021). Gefährdete Arten und Lebensräume in der Schweiz (Umwel-Vollzug). Bundesamt für Umwelt (BAFU); info fauna (CSCF).

Knaus, P., Antoniazza, S., Keller, V., Sattler, T., Schmid, H., & Strebel, N. (2021). Rote Liste der Brutvögel. Gefährdete Arten der Schweiz (2124; Umwelt-Vollzug). Bundesamt für Umwelt (BAFU); Schweizerische Vogelwarte.

Knowles, N., Scott, D., & Steiger, R. (2024). Sustainability of snowmaking as climate change (mal)adaptation: An assessment of water, energy, and emissions in Canada's ski industry. Current Issues in Tourism, 27(10), 1613–1630. https://doi.org/10.1080/13683500.2023.2214358

Körner, C. (2021). Alpine soils. In C. Körner (Ed.), Alpine Plant Life: Functional Plant Ecology of High Mountain Ecosystems (pp. 119–140). Springer International Publishing. https://doi.org/10.1007/978-3-030-59538-8_6

Kotlarski, S., Gobiet, A., Morin, S., Olefs, M., Rajczak, J., & Samacoïts, R. (2023). 21st Century alpine climate change. Climate Dynamics, 60(1), 65–86. https://doi.org/10.1007/s00382-022-06303-3

Krarup, T. M., & Blok, A. (2011). Unfolding the Social: Quasi-Actants, Virtual Theory, and the New Empiricism of Bruno Latour. The Sociological Review, 59(1), 42–63. https://doi.org/10.1111/j.1467-954X.2010.01991.x

Kujala, J., Heikkinen, A., Nieminen, J., Jokinen, A., Tapaninaho, R., Mäkelä, H., & International Association for Business and Society. (2019). Engaging with the Natural Environment: Examining the Premises of Nature-Inclusive Stakeholder Relationships and Engagement. Proceedings of the International Association for Business and Society, 30, 73–81. https://doi.org/10.5840/iabsproc20193010

Lancel, S. (1999). Hannibal. Wiley.

Landesamt für Umwelt Brandenburg. (n.d.). Moorschutz | Startseite | LfU. Retrieved 11 May 2025, from https://lfu.brandenburg.de/lfu/de/aufgaben/boden/moorschutz/#

Latour, B. (2005). Reassembling the Social: An Introduction to Actor-Network-Theory. Oxford University Press. https://doi.org/10.1093/oso/9780199256044.001.0001

Latour, B. (2018). Down to Earth: Politics in the New Climatic Regime. John Wiley & Sons.

Latour, B. (with Internet Archive). (1993). We have never been modern. Cambridge, Mass.: Harvard University Press. http://archive.org/details/wehaveneverbeenm0000lato

Latour, B., & Weibel, P. (2020). Critical Zones: The Science and Politics of Landing on Earth. MIT Press.

Law, J. (2004). After Method: Mess in Social Science Research. Routledge. https://doi.org/10.4324/9780203481141

Leimgruber, W. (2017). Tourism in the Swiss Alps: The Human Factor in Local Development. In R. Chand, E. Nel, & S. Pelc (Eds.), Societies, Social Inequalities and Marginalization: Marginal Regions in the 21st Century (pp. 273–287). Springer International Publishing. https://doi.org/10.1007/978-3-319-50998-3_17

Lenton, T. M., & Dutreuil, S. (2020). Distinguishing Gaia from the Earth System(s). In B. Latour & P. Weibel (Eds.), Critical Zones: The Science and Politics of Landing on Earth. MIT Press.

Light, D. (2014). Tourism and toponymy: Commodifying and consuming place names. Tourism Geographies, 16(1), 141–156. https://doi.org/10.1080/14616688.2013.868031

Lory, M. G. (1811). Alpabzug im Kanton Appenzell Innerrhoden [Aquarell und Feder in Schwarz über Graphit, allseitige Einfassungslinie in Schwarz, auf zusammengesetztem Papier vergé, kaschiert auf Papier vergé,Blattgrösse: 36.4 x 55.0 x 0.0 cm,Montierung: 38.8 x 57.2 x 0.0 cm]. n.a. https://doi.org/10.16903/ETHZ-GRS-Z_000079

Lovelock, J. (with Internet Archive). (1979). Gaia, a new look at life on earth. Oxford; New York: Oxford University Press. http://archive.org/details/gaianewlookatlif00loverich

Maggi, M. (1921). Valsertal, Zerfreila [Zervreila] [Graphic]. ETH Library Zurich, Image Archive. http://doi.org/10.3932/ethz-a-000129968

Markaki, M. (2024). ARCADIA: Politics of Land and Nature - From peripheralisation to extended citizenship [Doctoral Thesis, ETH Zurich]. https://doi.org/10.3929/ethz-b-000710069

McHarg, I. L. & American Museum of Natural History (with Internet Archive). (1969). Design with nature. Garden City, N.Y., Published for the American Museum of Natural History [by] the Natural History Press. http://archive.org/details/designwithnature00mcha

Merkblatt—Schweizer Alpkäse. (2011). yumpu.com. https://www.yumpu.com/de/document/read/5547887/merkblatt-schweizer-alpkase

Middeldorp, T. (2018). About—Embassy of the North Sea. Embassy of the North Sea. https://www.embassyofthenorthsea.com/over/

Moser, D., Gygax, A., Bäumler, B., Wyler, W., & Palese, R. (2002). Rote Liste der gefährdeten Arten der Schweiz: Farn- und Blütenpflanzen. Bundesamt für Umwelt, Wald und Landschaft, Zentrum des Datenverbundnetzes der Schweizer Flora, Conservatoire et Jardin botaniques de la Ville de Genève.

Nabholz, W. K. (1975). Geologischer Überblick über die Schiefersackung des mittleren Lugnez und über das Bergsturzgebiet Ilanz-Flims-Reichenau-Domleschg. Bull. Ver. Schweiz. Petroleum- Geol. u. -Ing., 42(101), 34–54.

Nassauer, J. I. (1995). Messy Ecosystems, Orderly Frames. Landscape Journal, 14(2), 161–170.

Neumayer, E. (2012). Human Development and Sustainability. Journal of Human Development and Capabilities, 13(4), 561–579. https://doi.org/10.1080/19452829.2012.693067

Noverraz, F., & Bonnard, C. (1998). Grands glissements de versants et climat. vdf.

Pauli, L. (1980). Die Alpen in Frühzeit und Mittelalter: Die archäologische Entdeckung einer Kulturlandschaft. C.H. Beck. https://cir.nii.ac.jp/crid/1130282270230483456

Peake, L., Razavi, N. S., & Smyth, A. (Eds.). (2025). Doing Feminist Urban Research: Insights from the GenUrb Project. Taylor & Francis. https://directory.doabooks.org/handle/20.500.12854/143917

Pornaro, C., Spigarelli, C., Pasut, D., Ramanzin, M., Bovolenta, S., Sturaro, E., & Macolino, S. (2021). Plant biodiversity of mountain grasslands as influenced by dairy farm management in the Eastern Alps. Agriculture, Ecosystems & Environment, 320, 107583. https://doi.org/10.1016/j.agee.2021.107583

Pütz, M., Gallati, D., Kytzia, S., Elsasser, H., Lardelli, C., Teich, M., Waltert, F., & Rixen, C. (2011). Winter Tourism, Climate Change, and Snowmaking in the Swiss Alps: Tourists' Attitudes and Regional Economic Impacts. Mountain Research and Development, 31(4), 357–362. https://doi.org/10.1659/MRD-JOURNAL-D-11-00039.1

Raffestin, C., & Butler, S. A. (2012). Space, Territory, and Territoriality. Environment and Planning D: Society and Space, 30(1), 121–141. https://doi.org/10.1068/d21311

Regionale Naturpärke. (n.d.). Kanton Bern. Retrieved 12 May 2025, from https://www.raumplanung.dij.be.ch/de/start/raumplanungsthemen/landschaft-und-oekologie/regionale-naturpaerke.html

Rillig, R. (2014). Transformation als Futuring. In Rosa-Luxemburg-Stiftung (Ed.), Futuring: Perspektiven der Transformation im Kapitalismus über ihn hinaus. Westfälisches Dampfboot.

Rixen, C., Stoeckli, V., & Ammann, W. (2003). Does artificial snow production affect soil and vegetation of ski pistes? A review. Perspectives in Plant Ecology, Evolution and Systematics, 5(4), 219–230. https://doi.org/10.1078/1433-8319-00036

Rocco, R. (2023). Spatial Justice. CENTRE FOR THE JUST CITY. https://just-city.org/team/spatial-justice/

Rosner, D. K. (2018). Critical Fabulations: Reworking the Methods and Margins of Design. The MIT Press. https://doi.org/10.7551/mitpress/11035.001.0001

Rüegg, P. (2020, September 18). Formation of the Alps: Detaching and uplifting, not bulldozing. Geology Page. https://www.geologypage.com/2020/09/formation-of-the-alps-detaching-and-uplifting-not-bulldozing.html

Schmid, A. (n.d.). The Rhine and Rigi should be allowed to go to court.

Schmid, B. R., Mermod, M., Zumbach, S., Rey, E., & Dosch, O. (2023). Rote Liste der Amphibien. Bundesamt für Umwelt (BAFU), info fauna.

Schmid, C., & Topalovic, M. (2023). Extended Urbanisation: Tracing Planetary Struggles. Birkhäuser.

Senn-Irlet, B., Bieri, G., & Egli, S. (2007). Rote Liste Grosspilze (0718; Umwelt-Vollzug). Bundesamt für Umwelt (BAFU): WSL.

Simons, M. (2017). The Parliament of Things and the Anthropocene: How to Listen to 'Quasi-Objects'. Techné: Research in Philosophy and Technology, 21(2), 150–174. https://doi.org/10.5840/techne201752464

Simonsen, J., Svabo, C., Strandvad, S. M., Samson, K., Hertzum, M., & Hansen, O. E. (2014). Situated Methods in Design. Situated Design Methods, 15–36. https://doi.org/10.7551/mitpress/9936.003.0003

Soja, E. W. (2013). Seeking Spatial Justice. U of Minnesota Press.

Somers, L. D., & McKenzie, J. M. (2020). A review of groundwater in high mountain environments. WIREs Water, 7(6), e1475. https://doi.org/10.1002/wat2.1475

Starik, M. (1995). Should trees have managerial standing? Toward stakeholder status for non-human nature. Journal of Business Ethics, 14(3), 207–217. https://doi.org/10.1007/BF00881435

Stecher, E. (2023). A Change of Matter. The Alps our living freshwater source and reservoir. Delft University of Technology.

Stettin, A. (2017, January 27). Parc Adula: Warum der geplante Nationalpark an der Urne scheiterte. Nachhaltigleben.ch. https://www.nachhaltigleben.ch/natur/parc-adula-warum-der-geplante-nationalpark-an-der-urne-scheiterte-3959

Sundberg, J. (2014). Decolonizing posthumanist geographies. Cultural Geographies, 21(1), 33–47. https://doi.org/10.1177/1474474013486067

swisstopo. (2017). Landeskarte 1:10000 (2017) [Map]. Bundesamt für Landestopographie.

Tappeiner, U., Tasser, E., Leitinger, G., & Tappeiner, G. (2006). Landnutzung in den Alpen: Historische Entwicklung und zukünftige Szenarien. In Alpine space—Man &

environment, vol. 1: Die Alpen im Jahr 2020. innsbruck university press. https://www.researchgate.net/publication/258375519_Landnutzung_in_den_Alpen_historische_Entwicklung_und_zukunftige_Szenarien

Tobias, S. (2024). Vom Regen zur Ressource Wasser (p. 2). Reallabor Jurapark. https://jurapark-aargau.ch/files/jurapark/pdf/Forschung/Reallabor/Vom%20Regen%20zur%20Ressource%20Wasser.pdf

Traversa, F. (2025). Revitalizing San Bernardino: A Sustainable Approach to Alpine Tourism Development. Strategies in Accounting and Management, 5(3). https://doi.org/10.31031/SIAM.2025.05.000615

Tronto, J. C. (1991). Gender, care and justice in feminist political theory. Anna Maria van Schuurman Centrum, Graduate School for Advanced Research in Women's Studies.

Tsing, A. L. (2015). The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins. Princeton University Press. https://doi.org/10.2307/j.ctvc77bcc

Van Zeeland, E. (2024, June 24). Design principles of the pluriversal design paradigm. DRS2024: Boston. https://doi.org/10.21606/drs.2024.295

Viviroli, D., Kummu, M., Meybeck, M., & Wada, Y. (2019). Increasing dependence of lowland population on mountain water resources. https://eartharxiv.org/repository/view/820/

von Haller, A. (1729). Die Alpen. https://www.projekt-gutenberg.org/haller/gedichte/alpen.html

Whatmore, S. (2002). Hybrid Geographies: Natures Cultures Spaces. 1–226.

Whgler. (2016). Blick vom Piz Mundaun auf Vella (links) und zum Piz Aul (rechte Bildhälfte) [Graphic]. Own work. https://commons.wikimedia.org/wiki/File:Blick_vom_Piz_Mundaun_Vella_Piz_Aul.jpg

Woodman, P. (2014). THE INTERCONNECTIONS BETWEEN TOPONYMY AND IDENTITY. Review of Historical Geography and Toponomastics, 9(17–18), 7–20.

World Glacier Monitoring Service (WGMS). (2023). Fluctuations of Glaciers Database (p. 35 MB) [Dataset]. World Glacier Monitoring Service (WGMS). https://doi.org/10.5904/WGMS-FOG-2023-09

Wyss, R., & Isler, A. (2011). 1214 Ilanz, Erläuterungen. Geologischer Atlas der Schweiz 1:25000. Bundesamt für Landestopographie.