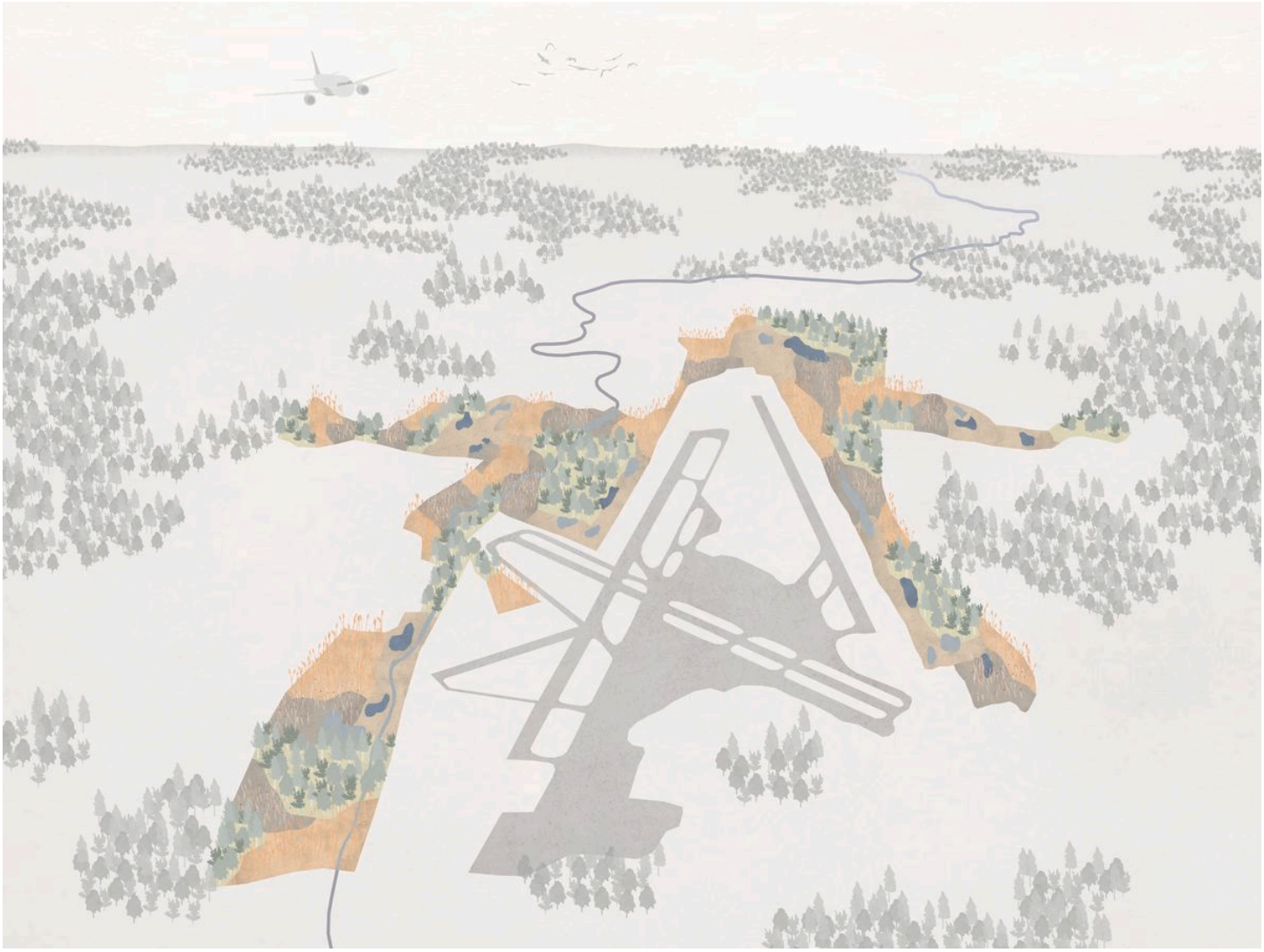
ETH Zurich Department of Architecture
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Chair of Architecture
and Territorial Planning
Professor Milica Topalović

Nothing but Flowers
Fall 2021

Airport und Glatt

Rethinking Ecological Compensation: The Production of Nature Around Zurich Airport

Jan Zimmermann and Marco Steinacher

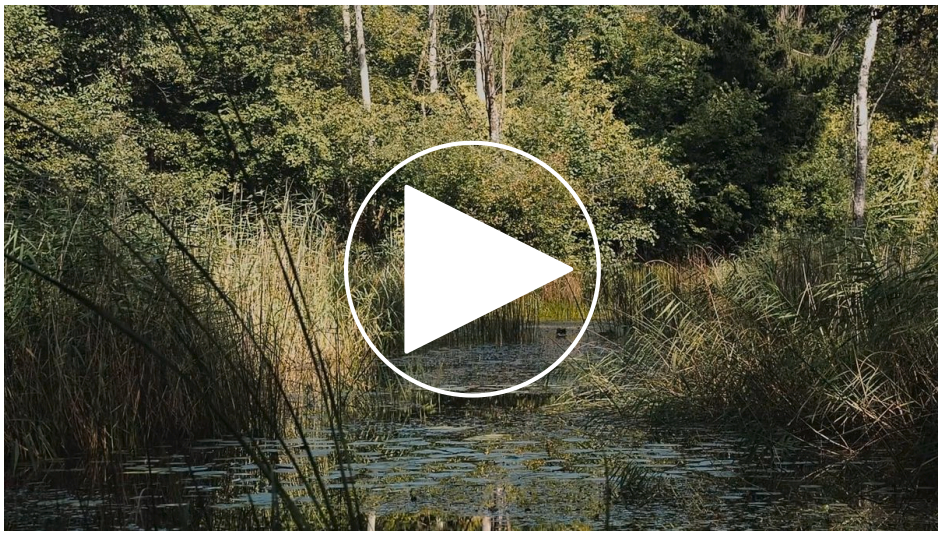


The land around Zurich Airport is highly embattled. Growing settlements and airport expansions cause the displacement of wetlands, forests, and agricultural area. Due to the rising pressure on unbuilt land, the so-called ecological compensation is introduced — a planning tool to regulate the handling of ecologically valuable areas: Land claimed by construction projects has to be replaced elsewhere. But the execution of this tool eventually leads to a fragmentation of compensation measures. On a local scale, hybridisation of land use through the strategy of ecological balance presents an alternative to the practice of compensation. Extending and connecting the already existing habitats, a nature belt is created around the airport territory.

The Impact of an Airport from Local to Planetary

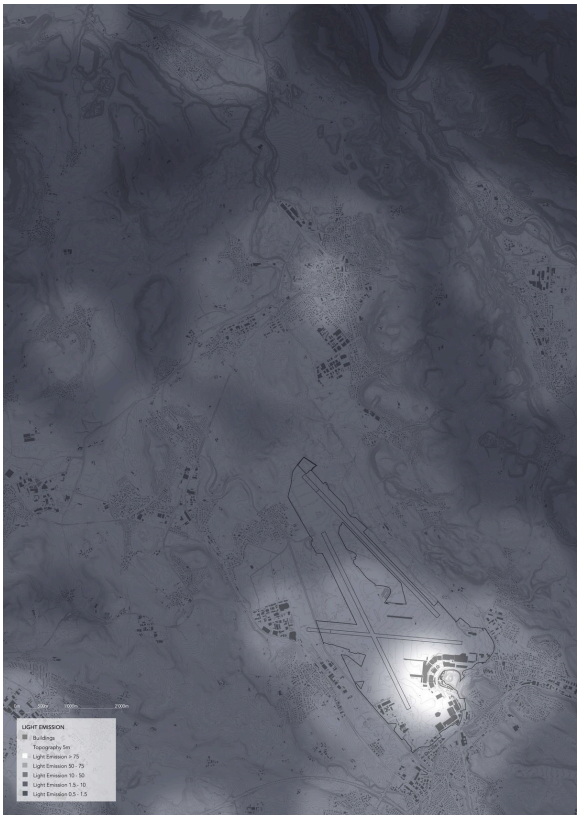


Even if not directly visible, the noisy aircraft can be heard constantly in the Canton of Zurich. From morning to evening, planes land and take off every minute. As an intensively used infrastructure, the airport has an impact on the landscape which extends the regional boundaries.

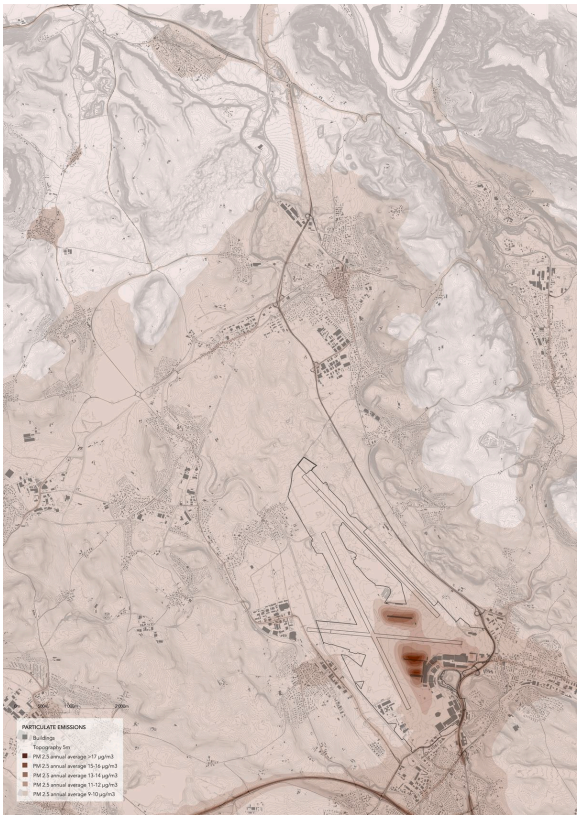


Impact of aircraft noise on the surrounding territory.
https://vimeo.com/648223974

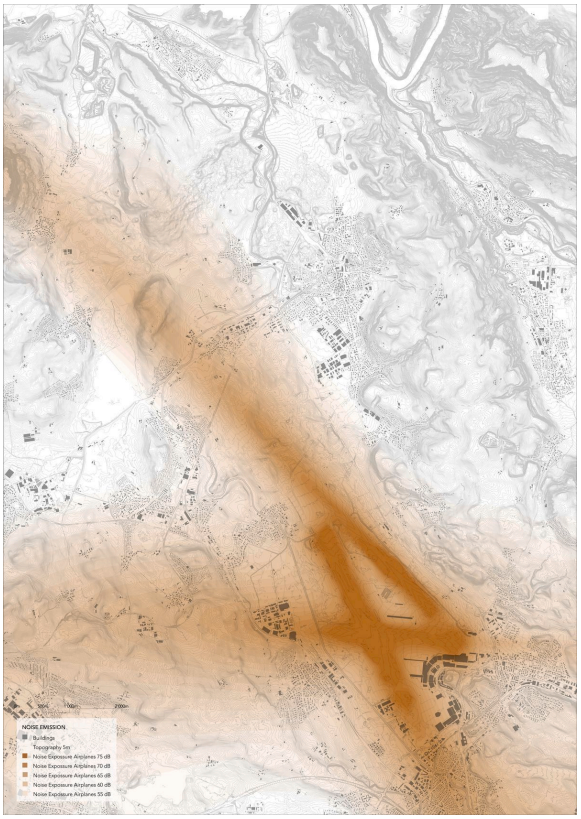
In the middle of a clearing, surrounded by tall deciduous trees, a pond is shimmering between the swaying reeds. Two ducks contentedly drift along. Absorbing the quiet atmosphere, we almost don't notice a roaring noise, slowly getting louder and making the surface of the water tremble lightly. While it approaches, we try to make sense of this out-of-place sound. We cover our ears when suddenly a shining white airplane sweeps over our heads. Observing the space around us, we realize that none of the birds is bothered by this deafening noise. A black coot peacefully floats on the glistening water, and a sparrow is hopping on the green grass. They seem to be accustomed to the recurring sound of the airplane engines, it's just another day living close to the airport.



Light emission.



Particulate emission.



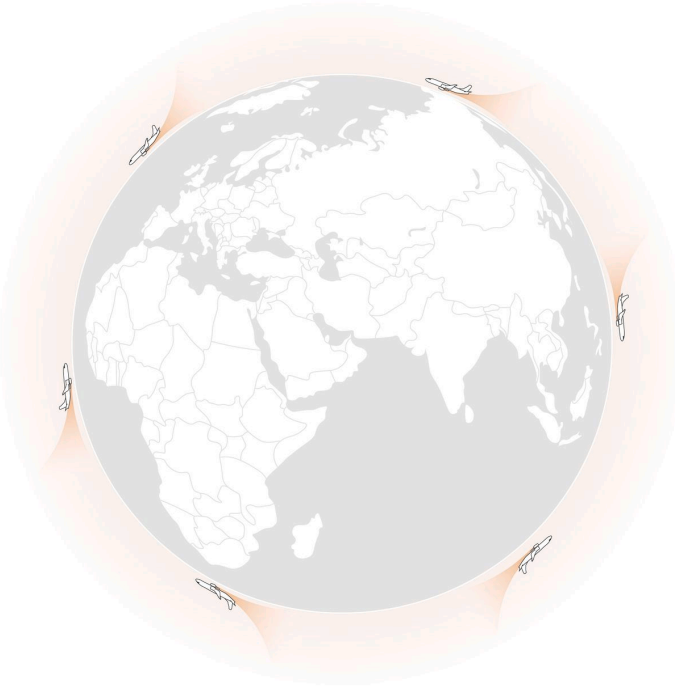
Noise emission.

This impact of the airport is not limited to the directly perceivable noise inside the air corridor. Flight operations also cause significant light and particulate pollution, hazards which are mostly encountered around the airport terminals.



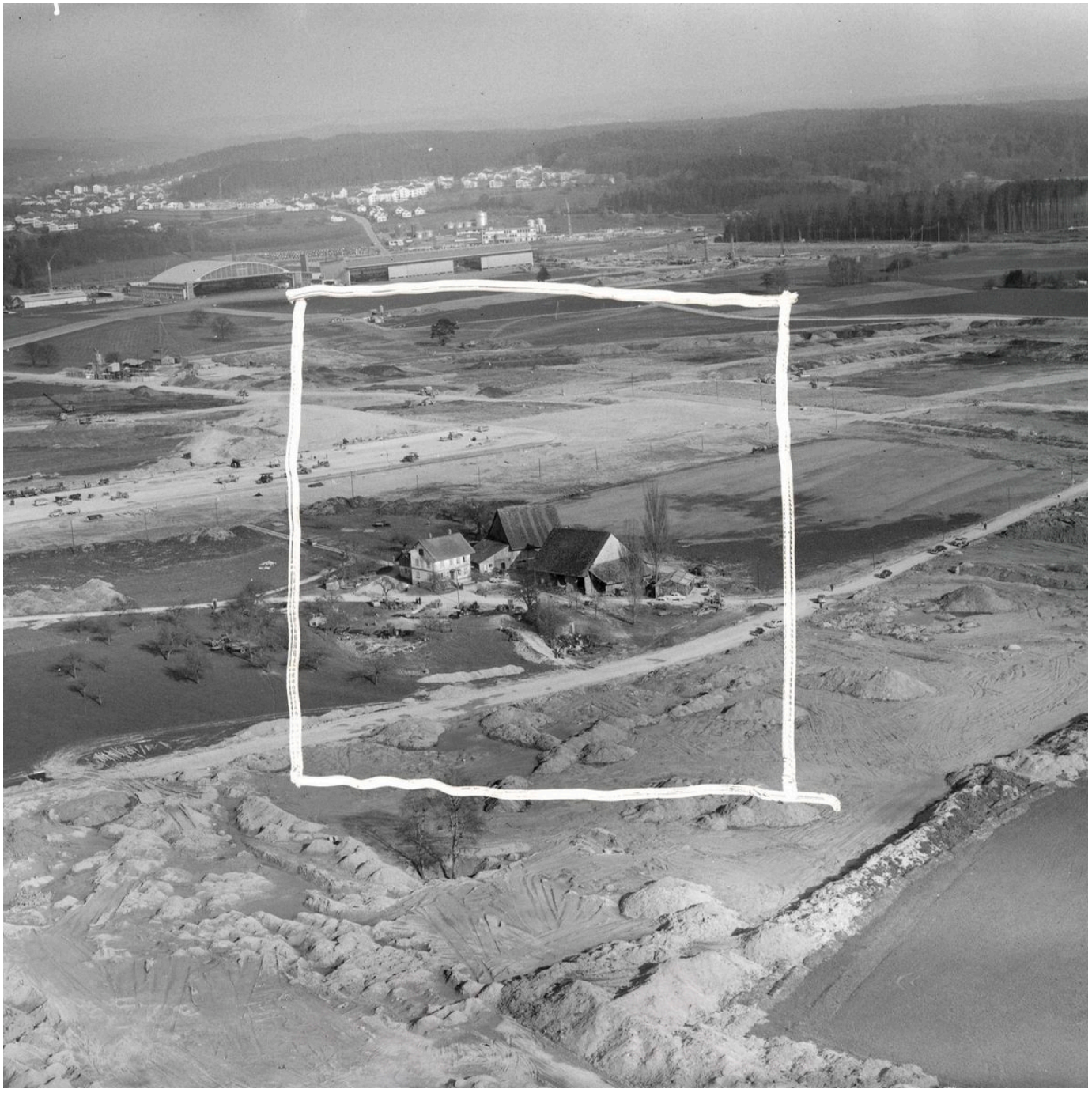
Airplane over settlement area.

The impact of CO_2 emission on the other hand extends beyond the regional boundaries and reaches a global scale. Aircrafts cause 2% of all emissions. Planes taking off from Switzerland alone cause 5.4 million tonnes of CO_2 per year. This means that air traffic has an enormous influence on climate change. Despite increasingly efficient machines, emissions are still rising due to the increasing growth of the flight industry.

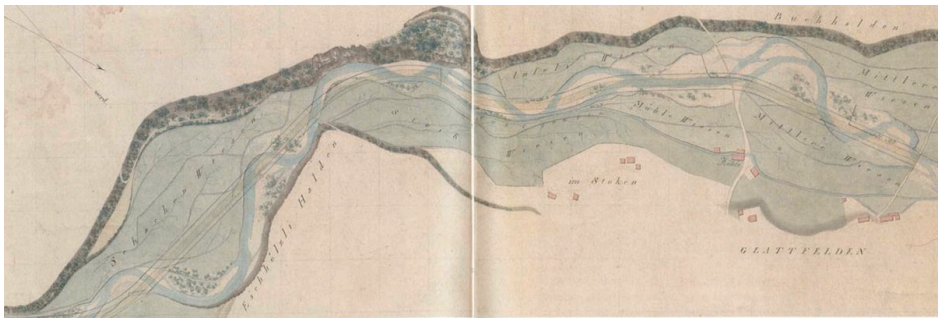


Global CO_2 emissions.

Displacement of Unbuilt Land in the Glatttal



In the middle of the 20th century, the government decided to prefer the plain of the Glatt Valley to a Bernese agricultural area for the location of the new Swiss airport. Thus, a huge infrastructure project was placed in the territory and valuable natural habitat was lost. With simultaneously growing settlements, unbuilt land was put under pressure.

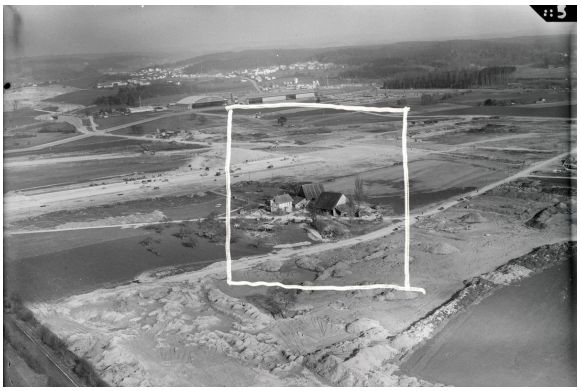


Correction of the Glattverlauf. Source: Staatsarchiv Zürich, 1813.

Small villages and wide agricultural fields characterised the landscape of the Glatt valley in the 19th century. In large turns the river Glatt winds past forests and moors. The meandering stream, although beautiful to look at, repeatedly leads to devastating floods. Due to the severe consequences, Hans Konrad Escher von der Linth drew up an expert opinion on the correction of the Glatt. The straightening subsequently carried out by the government led to a reduction of flood events and a lasting change in the visual landscape. The ongoing drainage of wetlands slightly increased the agricultural area.



Runway construction for the new Zurich airport. Source: ETH Library - Bildarchiv, 1947.



Arising conflicts due to the airport extension. Source: ETH Library - Bildarchiv, 1959.

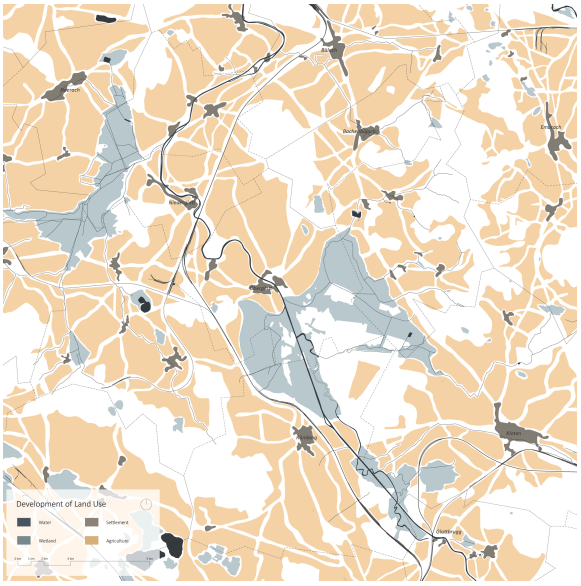


Transplantation of wetland area at the airport. Source: ETH Library - Bildarchiv, 1973.

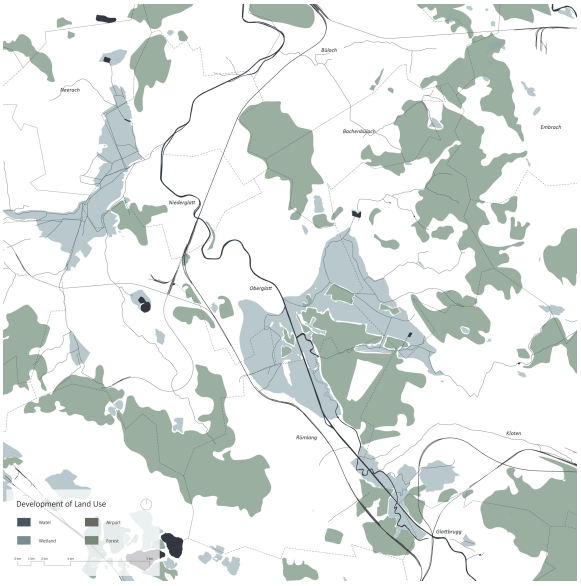
At the beginning of the Second World War, food was getting scarce in Switzerland. To secure the supply of the population, Friedrich Traugott Wahlen introduced the so-called Plan Wahlen. By increasing production and rationing the available food, Switzerland's self-sufficiency had to be ensured. Between 1940 and 1946, over 80,000 hectares of land were drained in Switzerland as part of an extensive melioration program. Wetland areas were further reduced.

After its implementation in 1987, the Federal Initiative for the Protection of Wetlands, also known as the Rothenturm-Initiative, led to the slow recovery of wetlands. With simultaneously sprawling settlements, these changes ultimately resulted in a loss of agricultural land.

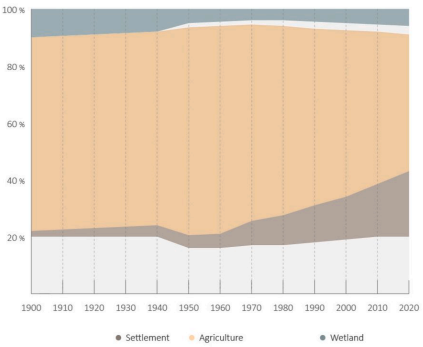
By clearing a vast woodland area, space was made available for the first construction period of the airport. Subsequent airport expansion projects were carried out at the expense of surrounding wetland areas. With great effort, some of these areas could be relocated.



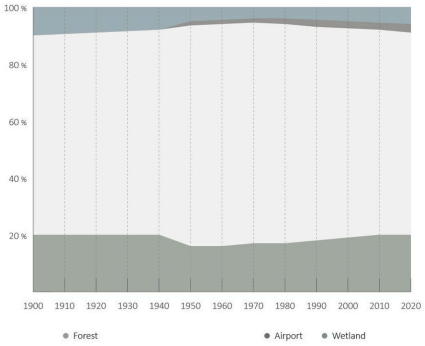
History of settlements, agriculture and wetlands.



History of water, wetland and forest.



Area of settlements, agriculture and wetlands.



Area of water, wetland and forest.

The historical developments in the Glatt valley eventually led to a highly embattled landscape with complex relations between different actors. Various interests and negotiation methods therefore constantly affect the changing territory.

Limits of Ecological Compensation



Land is a valuable resource that has been a cause for discourse, disagreement, and dispute since the introduction of property ownership. Due to the scarcity of land, the pressure on unclaimed areas is constantly increasing. Nowadays, such regions are hardly available anymore. Regulations and processes that are supposed to control the sustainable development of territory only lead to a fragmentation of compensation measures.



Ruedi Zimmermann
Farmer near the Neeracherried.



Relocation of the road at the Neeracherried.



Stefan Heller
Head of nature center Neeracherried.

Due to the scarcity of land as a resource, conflicts arise wherever new projects claim land. In the northern territory of the airport, heavily frequented roads run through the Neeracher Ried and connect the surrounding villages.

“The marsh is crossed by 10’000 vehicles per day. This means that if a frog or a young bird attempts to cross the road, the chance is relatively high that the animal will be run over.” - Stefan Heller

The passing cars are a threat to the animals in the nature reserve. Stefan Heller, the head of the nature center at the Neeracherried, argues that these roads are a cause for disturbances that prevent certain species from settling. Vehicles also have an indirect impact by bringing toxic substances into the reed that poison the soil.
With the vote for the Rothenthurm Initiative, wetlands became protected and building within the moor landscape restricted. Some of the roads in the reed were built during the second world war and therefore must soon be renewed. The relocation of the roads would allow the Neeracherried to become a quiet zone. But this means that land outside of the marsh is needed for the project.

“As soon as they remove the road from the reed, they will have to build it on my land and therefore destroy my farming business.” - Ruedi Zimmermann

The local farmer Ruedi Zimmermann owns land that is potentially used for the construction of the new road. He is concerned about the land that is taken away from him. The land used for the construction is a crop rotation area (Fruchtfolgefläche) that needs to be compensated somewhere else.

“Maybe I’ll get some other land. But then they take it away from someone else. There is not more land.” - Ruedi Zimmermann

Ruedi Zimmermann explains that one third of his crop rotation areas would be affected by the road construction and he would not receive new land for his loss.



Adrian Zysset
Farmer in and around the airport area.



Glatt renaturation at the Zurich airport.

“When the credit is used up, you need a new area. With the projects we are currently planning, our previous compensation project has been used up for a long time, so we need new areas. ” - Caterina Talerico

At the airport Zurich, land compensation is a very common tool. Whenever the airport plans a building project, they are obliged to compensate the affected land. Revitalisation projects are made in advance. With a score system, credits are taken away for every extension of the airport until used up. Sometimes the land for renaturation does not needed to be bought by the airport because the land still can be farmed by the owners. Sometimes it is enough to change the type of farming.

“Sometimes we compensate for crop rotation areas, but in doing so we trigger ecological compensation measures.” - Caterina Talerico

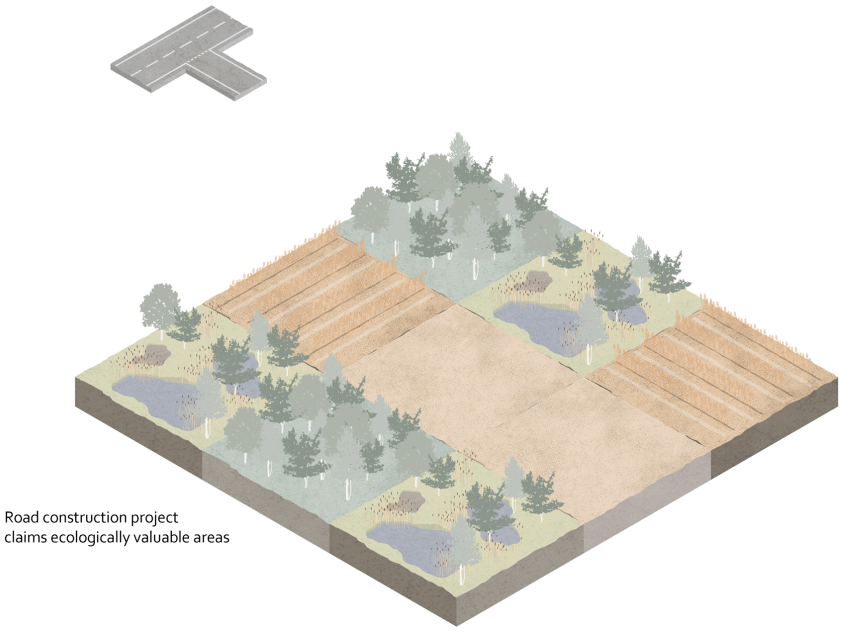
Since the airport is now planning to expand the runways and the credits for compensation have been used up, the revitalization of the Glatt needs to be realised. But again, land is being used that is protected as crop rotation area and therefore must be compensated elsewhere.

“It is a theoretical game, the land is limited, you cannot increase it.” - Adrian Zysset

Adrian Zysset is a farmer who cultivates a lot of land at the airport. However, he also owns land outside the perimeter that would be affected by the revitalization of the Glatt. He doubts the usefulness and practicality of the compensation methods applied in these situations.

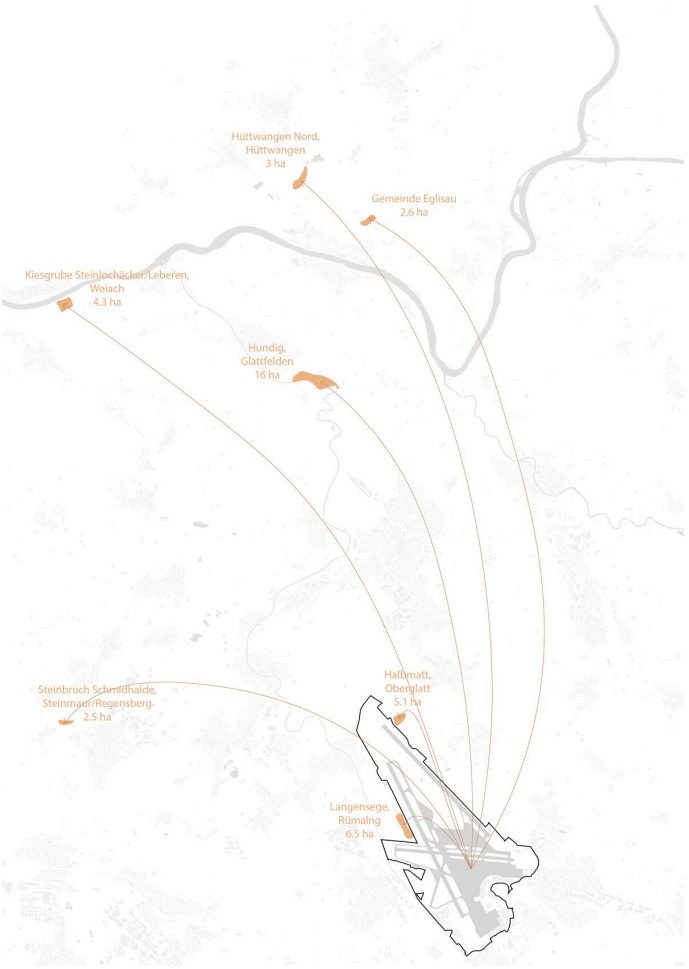
The Federal Law on the Protection of Nature and Cultural Heritage serves to restore a natural situation whenever protected natural habitats are impaired. Once a construction project is planned, the ecological biosphere that will be affected during construction is evaluated. The person or institution causing damage is then obliged to protect the encountered nature as best as possible or to carry out suitable restoration or replacement measures.
A similar concept is applied whenever crop rotation areas (Fruchtfolgeflächen) are being claimed. The canton of Zurich is obligated by the Swiss government to provide 44,000 hectares of these fertile grounds. Currently, this target is just barely met, which is why the land must be qualitatively replaced as soon as a construction project damages it. The indicative map for anthropogenic soils points out areas where upgrading measures can be implemented. Once these places are set, a complicated method regulates the quantity and quality of the replaced or upgraded ground.

These compensation processes provide what appears to be a successful system in which lost land is replaced by a series of measures. Yet it is not considered that land is a limited resource. The areas available to us are already being used to the maximum. A claim of valuable ground causes a chain of land exchange, at the end of which agricultural area is lost. Although this loss is compensated with a qualitative enhancement of anthropogenic soils, the absolute amount of area cannot be sustained.



Displacement of land through compensation processes.

In the last 20 years, the Zurich airport realised various projects in the region as compensation measures. These areas serve to replace habitats that have been destroyed by the airport's building activities. Since most of the land around the airport territory is already occupied, such projects are only possible in a few places, for example in unused gravel pits. The lack of available land therefore results in a fragmentation of compensation measures.



Regional compensation measures by the airport Zurich.

The aircraft that take off from Zurich Airport pollute the air with a large amount of CO2. Passengers are given the opportunity to pay a compensation tax for the emissions caused by the flight. Companies like “MyClimate” then realise compensation projects in various countries all around the world. In 41 different countries, 144 projects are being realised with which one can reduce carbon emissions. For example, by investing in a wind farm in Turkey, biogas in India, reforestation in Madagascar or hydroelectric power plants in Indonesia, one can save CO_2 and thus compensate for one’s flight. The measures are not carried out in one place but are realised where it is most economical. The result is once again a scattering of different projects.



Global CO_2 compensation measueres.

Hybridisation of Landscape as an Alternative

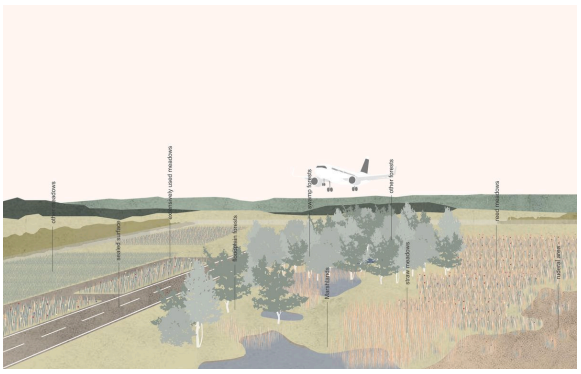


While extensions of the airport are reached by compensation, within the airport boundaries a different principle comes into play. Hybridisation of different landscapes offers a potential as an alternative to compensation.

Due to safety of flight operation, large surfaces within the airport are unused. This allows nature, as well as agriculture to be part of a very diverse landscape, where several actors profit from one another. About 50% of the area within the airport perimeter are sealed surfaces. But within the uncovered area there is a huge variety of different landscapes: extensively used meadows, floodplain forests, swamp forests, marshlands, straw meadows, reed meadows and ruderal areas.



Landscape at the airport Zurich. Source: Zurich Airport.



Land uses at the airport.

For safety reasons, a lot of open land is needed in the airport area. Some of these areas are extensively farmed, others are nature reserves. The extensive biodiversity areas can be let to farmers who receive direct payments from the canton for the cultivation. They also produce valuable hay from these meadows. In addition, the land provides habitats for many different insects and small mammals. The airport fence provides protection for rare animals from disturbance by humans, but also by domestic animals.



Extensive meadows at the airport: Source Zurich Airport.



Weasel hideout at the airport. Source: Zurich Airport.



Hay from the airport.

Most of the wastewater produced by the de-icing of the aircraft is recycled. However, the less polluted part is rained on the meadows of the airport area, cleaned through the soil, and released into the Glatt. As one of the most species-rich habitats, wetlands on the site continue to contribute to a high level of biodiversity and can prevent flooding as a water storage.
The introduction of the weasel is an attempt to reduce the food supply for birds. Long grass cultivation also makes it more difficult for birds to identify prey. With these methods, bird strikes can be prevented. In 2020 a new light management system was introduced that allows to control the lights on the airport. This is not only beneficial for nature to reduce emission but also for the airport, because it reduces the effort of maintenance.

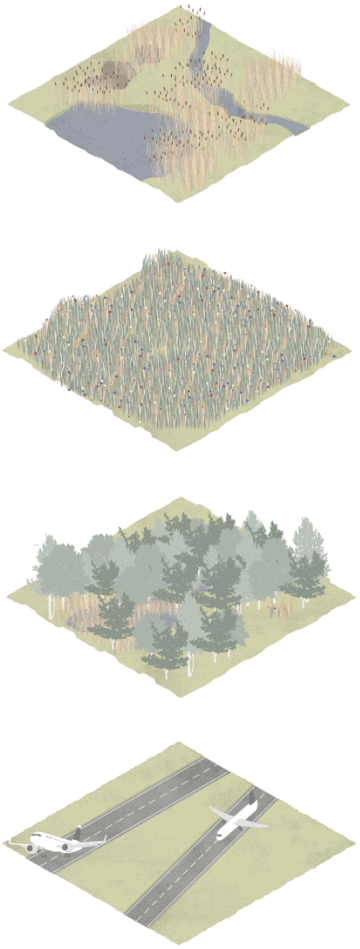


Sprinkler system to spray de-icing water over grassed areas. Source: Zurich Airport.



De-icing airplanes at the airport Zurich. Source: Zurich Airport.

The stacking of different land uses results in a hybridisation of the landscape that produces mutual benefits for several actors. This environment of cooperation can serve as an alternative to compensation measures and prevent the displacement of one land use by another.



Hybridisation of different land uses.

The Strategy of Ecological Balance and the Project of a Nature Belt

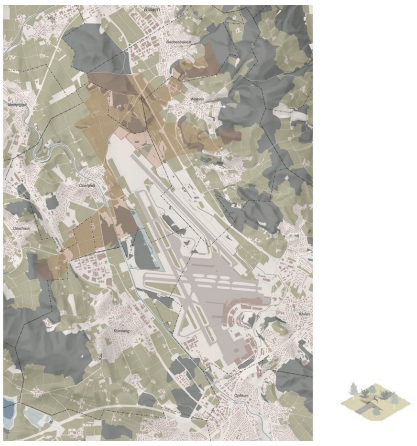


A biodiverse landscape around the airport is introduced to stop the displacement of unbuilt land. The design proposal is based on restrictions and potentials of the territory and follows an integrative approach of hybridisation. Implemented in a local process of ecological balance, the belt provides an extension of the already existing habitat inside the airport boundaries.

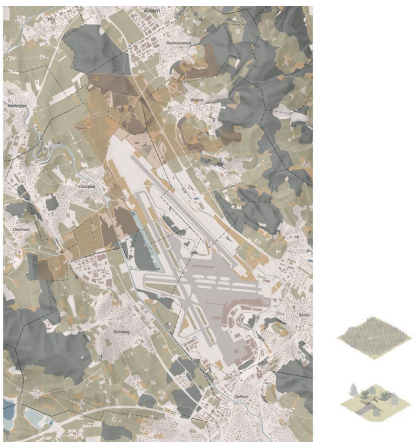
The territory around the airport is an area with many different functions and opportunities. Wildlife corridor, biodiversity areas, protected wetlands, anthropogenic soils (potential to relocate crop rotation areas), potential areas for wetlands, nature protection and no crop rotation areas.
The land with the most layers and therefore under the highest pressure determines the boundaries of the investigated territory.
A part of the resulting structure was studied in more detail to develop a strategy that can be applied to the whole belt around the airport.



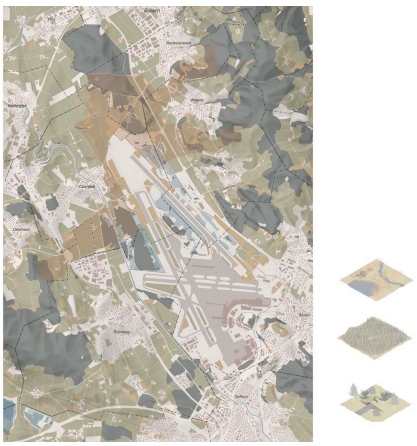
Surrounding territory of the airport Zurich.



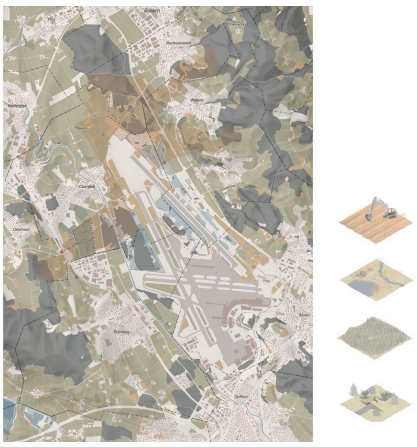
Wildlife corridor.



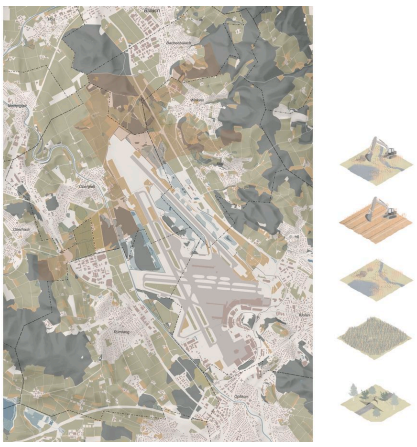
Biodiversity area.



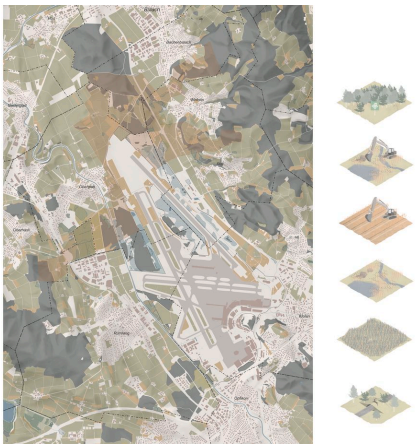
Protected wetlands.



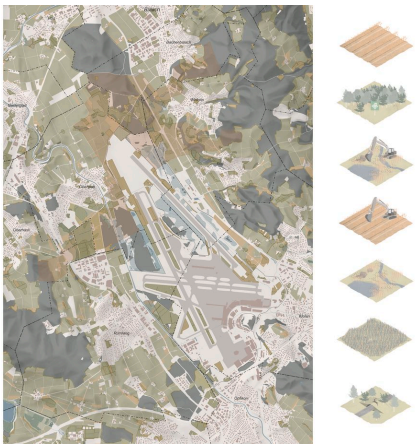
Anthropogenic soils.



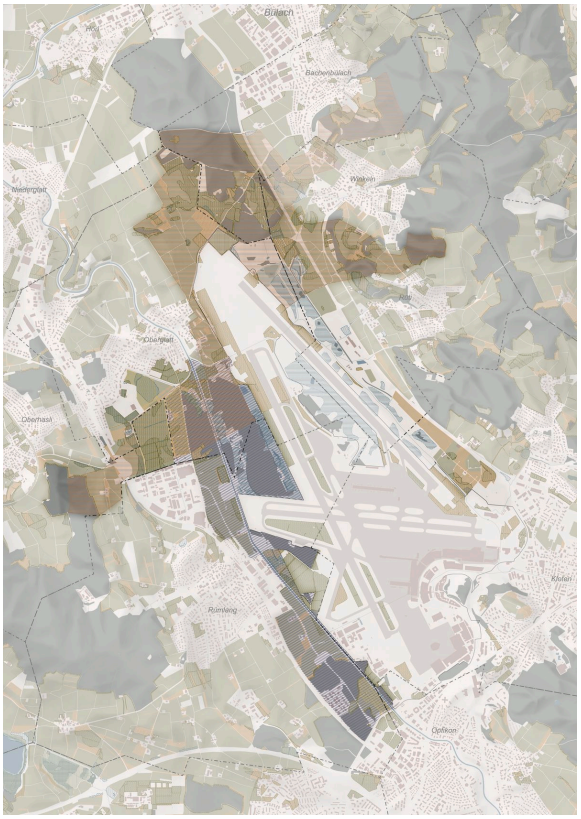
Potential areas for wetlands.



Nature protection.



No crop rotation areas.



Layers within the nature belt perimeter.

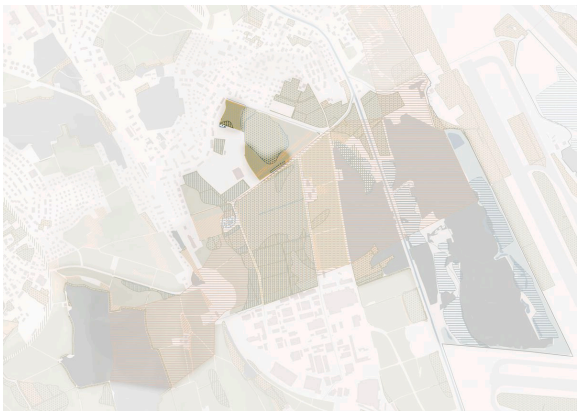


Satellite image of the nature belt perimeter.

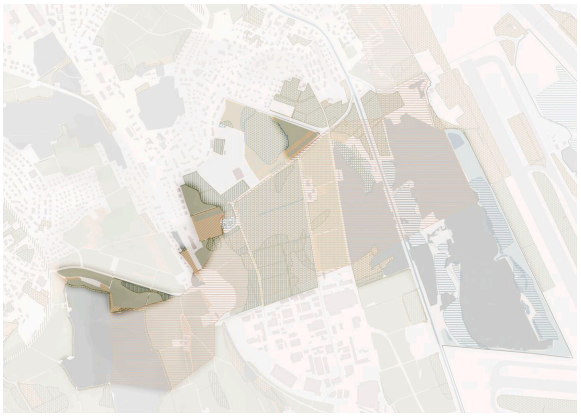
One of these regions (zone three) spans from a small hill over a road and is determined as wildlife corridor, crop rotation areas with some fields of biodiversity areas. The road and tracks are an impassable obstacle for animals, while the green strips with trees and bushes are useful for animals to move along.
Another example (zone six) is a flat region in between two small streams. The agricultural field is marked as crop rotation area but also as anthropogenic soil, which means that the ground has not top quality but is still valuable for production. The zone is also noted as potential area for the restoration of wetlands and wildlife corridor. Wide fields with vegetation and streams as hideouts for animals characterise this region.



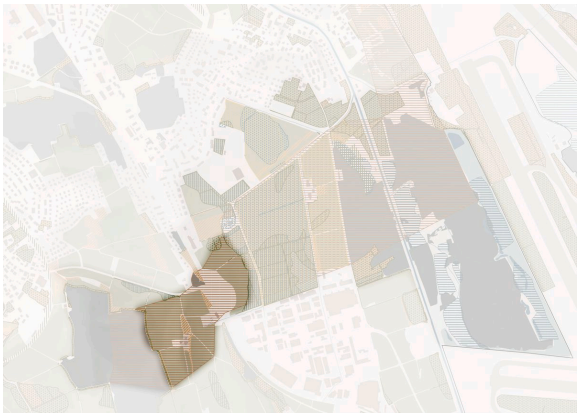
Analysis zones.



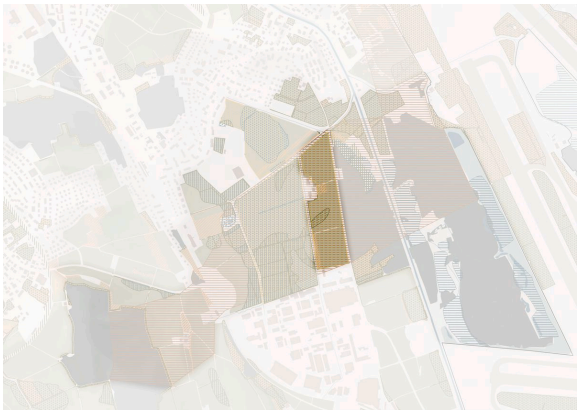
Zone 1.



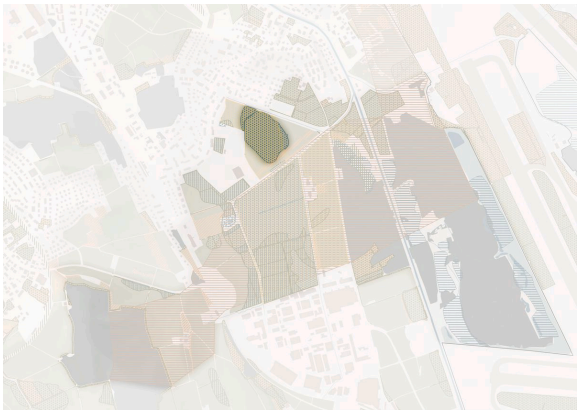
Zone 2.



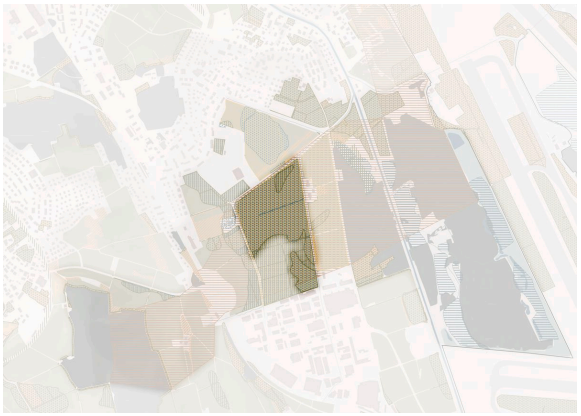
Zone 3.



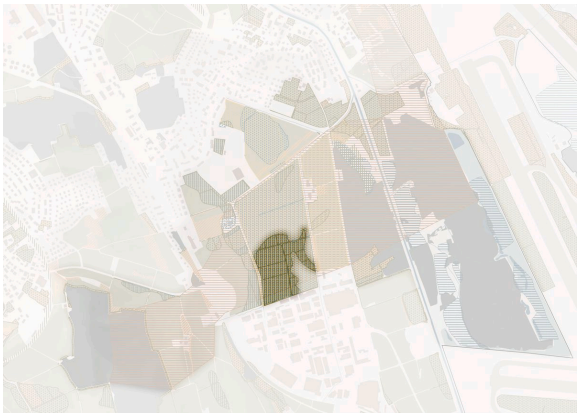
Zone 4.



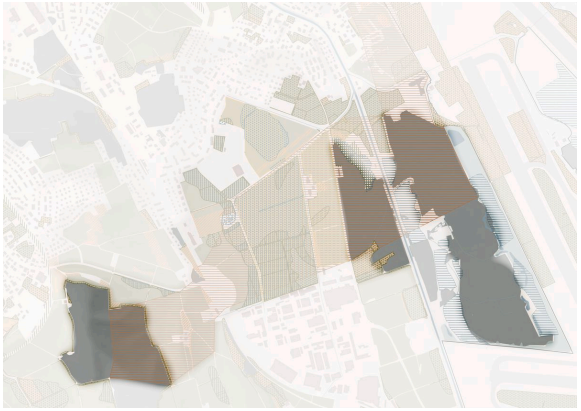
Zone 5.



Zone 6.



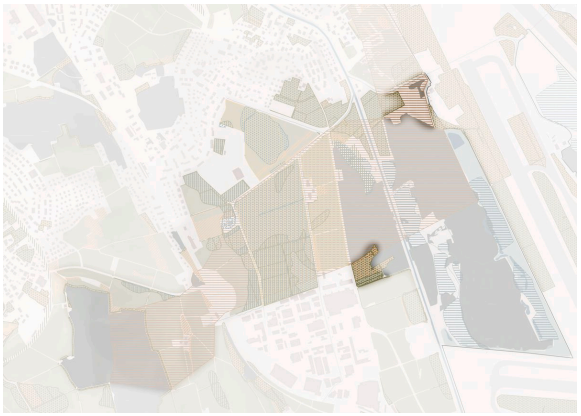
Zone 7.



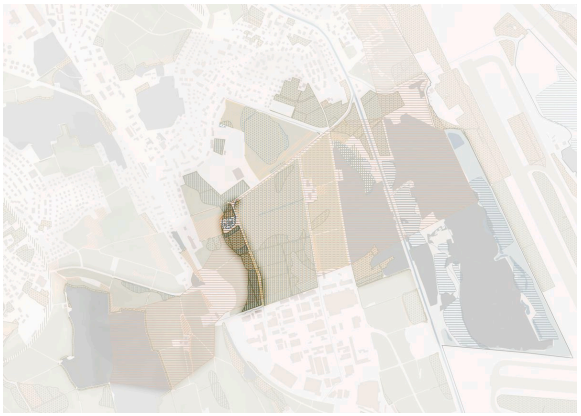
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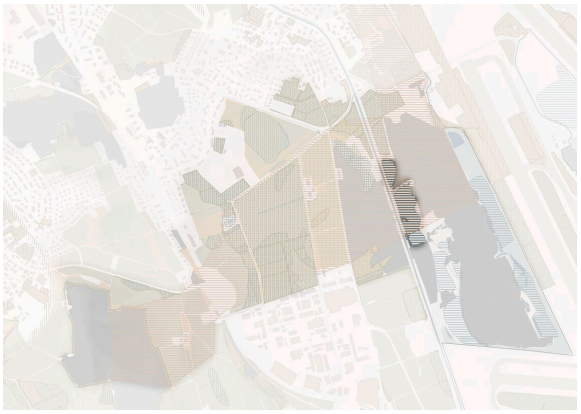
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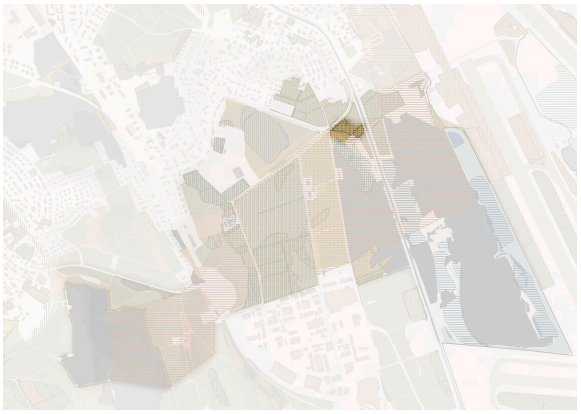
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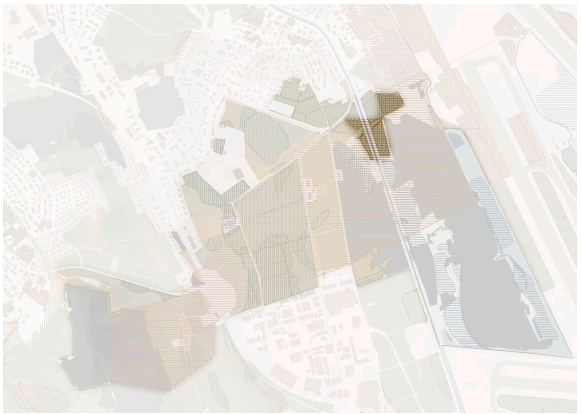
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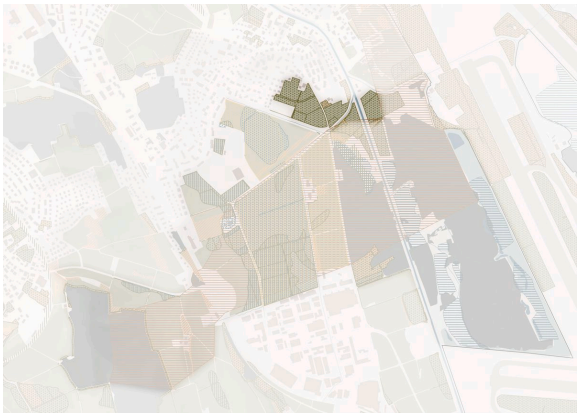
Zone 12.



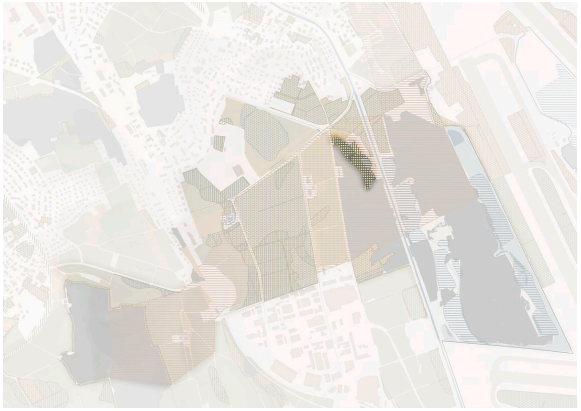
Zone 13.



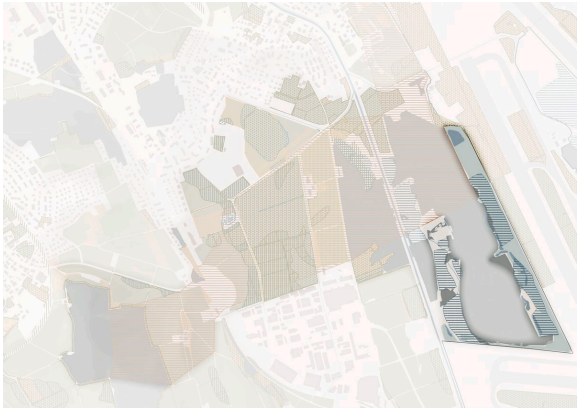
Zone 14.



Zone 15.



Zone 16.



Zone 17.

As a result of the territorial analysis, a site-specific design proposition was developed that incorporates a hybridisation of the landscape and the intention to enhance biodiversity. Existing projects like the planned renaturalisation of the Glatt have been integrated into the concept.



Detail of the nature belt after the intervention.

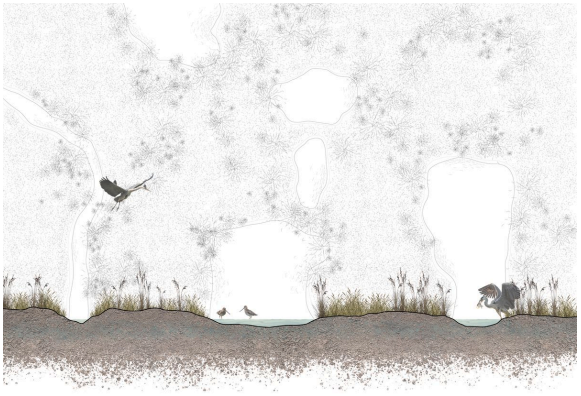


Zones within the nature belt.



Detail of the nature belt before the intervention.

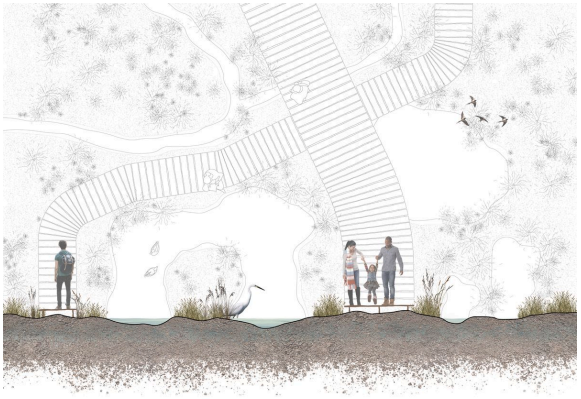
In the area of the productive wetland the soil quality is not highly fertile but still relevant for production. Because the location is ideal for the restoration of wetlands, a productive wetland is created where it is possible to plant rice, locate cattle or cultivate reeds for energy production.
In other regions, the quality of soil and therefore the need for production decreases. Still, the conditions to restore and preserve wetlands are ideal. In these protected wetland areas, cultivation is restricted, and rare species can settle. The space is not accessible to humans.
Close to the village of Oberglatt another wetland is restored for leisure. Here it is possible to go for a stroll and enjoy nature, because the area is not part of the wildlife corridor and does not need to be freed from interference.
The wetland areas are framed by floodplain forests which can be used for wood production. Similarly, it serves as a diverse habitat and an important hideout for wildlife.
Wetlands are vulnerable for pesticides used in intensive agriculture. The surrounding regions are therefore determined as biodiversity areas. Besides increasing biodiversity, they are beneficial for movement in the wildlife corridor, create valuable habitats for small mammals and insects, and provide pesticide-free hay.
Areas which are valuable for agricultural production still should be cultivated for such, but in a more sustainable way. The introduction of mixed cultures like the cultivation of corn, runner beans and pumpkin right next to each other results in an increased output, more biodiversity and higher resilience to natural disasters.



Protected wetland.



Productive wetland.



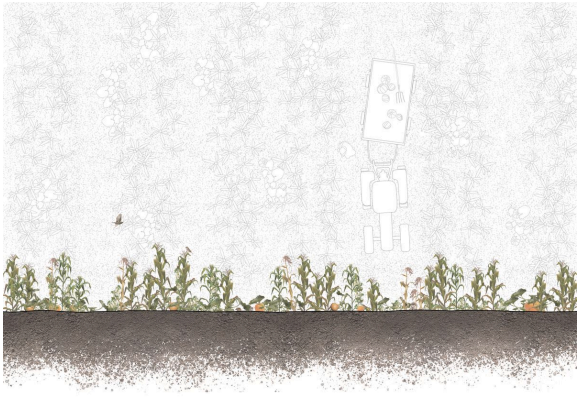
Interactive wetland.



Floodplain forest.

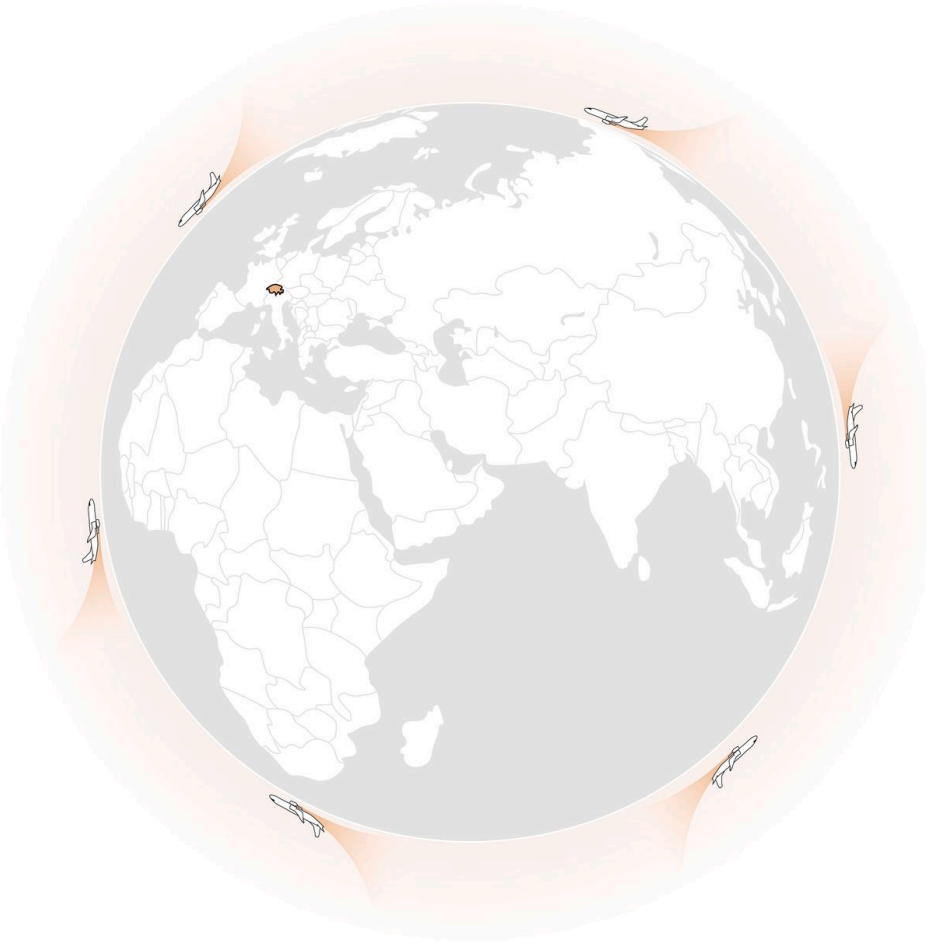


Biodiversity area.



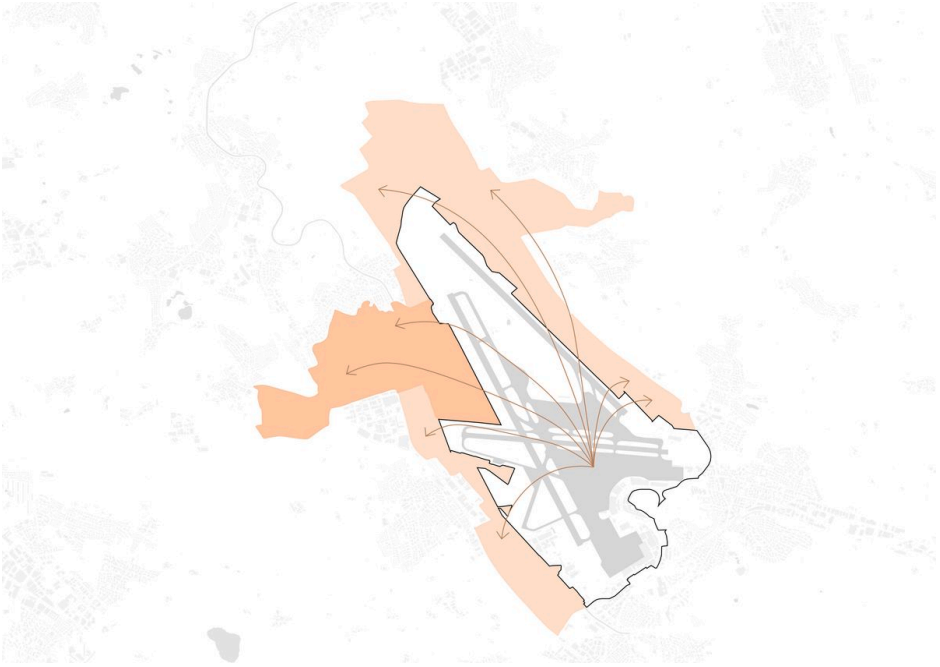
Mixed culture.

Flights from Switzerland cause 5.4 million tonnes of CO_2 each year. Nowadays, attempts are being made to control these emissions through compensation projects all around the globe. The result is a fragmentation of different projects and measures. Bringing back ecological CO_2 balance on a local scale will stop the colonisation of compensation. The effects become tangible for everyone and an attachment to self-caused emissions is possible. Furthermore, the projects are under the control of the polluters. The ecological balance itself however won't be enough to change current compensation processes to a sustainable alternative. A shift in means of transportation is necessary to decrease the overall impact of airport traffic.



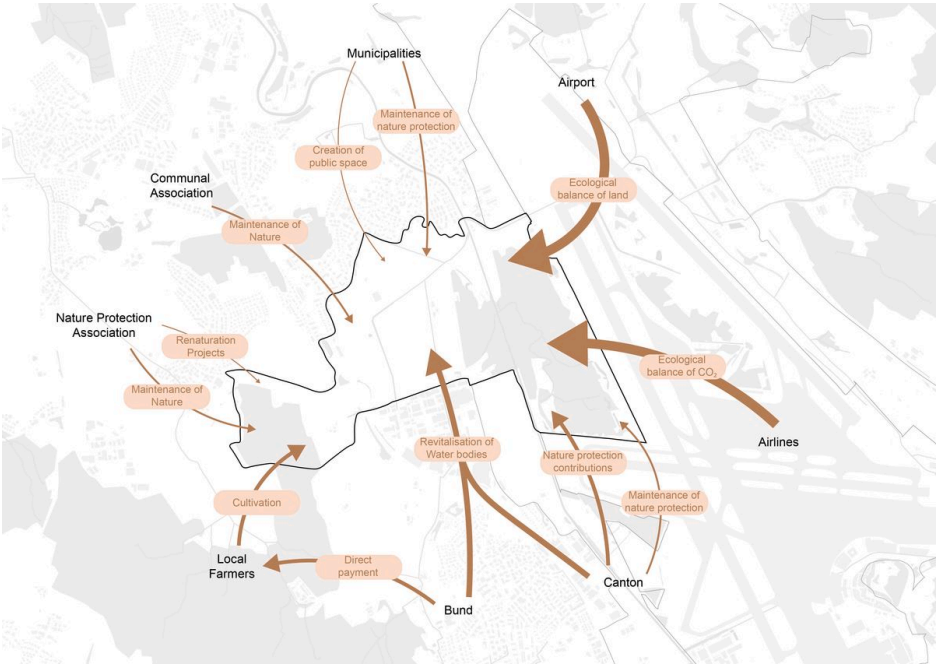
Ecological balance of CO_2 at a local scale.

While climate change is a global crisis, the loss of biodiversity occurs on a smaller scale. Although the compensation measures for the extension of the airport are made on a regional level, the projects are still fragmented. With the introduction of a belt, biodiverse nature is produced locally as an extended landscape of the already existing habitats inside the airport territory.



Ecological balance of land at a local scale.

Together with several other measures, ecological balance of land by the airport and ecological balance of CO_2 by the airlines are part of the financial strategy. The revitalisation of the Glatt by the Bund and the Canton Zurich can be part of the project such as the cultivation by local farmers and the maintenance of nature reserves by nature protection associations.



Maintaining and financing the nature belt.

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SOURCES

- Amt für Raumentwicklung Kanton Zürich (Hg.), *Landschaftsentwicklung Glattraum – Rümlang/Oberglatt*, 2014. https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/planen-bauen/raumplanung/dokumente/publikationen/bericht_landschaftsentwicklung_glattraum.pdf
- Amt für Raumplanung (Hg.), *GIS Browser*. https://maps.zh.ch Bundesamt für Landestopografie, *das Geoportal des Bundes*, www.geo.admin.ch
- Bächtold & Moor AG Ingenieure und Planer ETH/SIA/USIC, *Ökologische Ausgleichsflächen und Flugsicherheit*, Bern 2017. https://www.bafu.admin.ch/bafu/de/home/themen/biodiversitaet/publikationen-studien/publikationen/oekologischer-ausgleich-flugplaetze.html
- Brunner, Walter, *Glattkorrektion im 19. und 20. Jahrhundert. Wasserbau und Gesetzgebung als Spiegel des Staatsverständnisses*, Dipl.-Arbeit, Universität Zürich 2017. https://www.zop.zb.uzh.ch/bitstream/123456789/374/1/Glattkorrektionen_Brunner.pdf
- Bundesamt für Statistik (Hg.), *STAT-TAB – interaktive Tabellen*. https://www.bfs.admin.ch/bfs/de/home/dienstleistungen/forschung/stat-tab-online-datenrecherche.html
- Bundesamt für Zivilluftfahrt (Hg.), *CO2-Emissionen des Luftverkehrs. Grundsätzliches und Zahlen*, 2020. https://www.bazl.admin.ch/bazl/de/home/suche.html#CO2-Emissionen%20des%20Luftverkehrs%20Grundsätzliches%20und%20Zahlen
- Dr. Bal, Rafael (Hg.), *ETH zürich e-pics*. https://www.e-pics.ethz.ch/de/home/
- Fachstelle Naturschutz Kanton Zürich (Hg.), *Altläufe der Glatt. Oberglatt Rümlang*. https://www.zh.ch/content/dam/zhweb/bilder-dokumente/themen/umwelt-tiere/naturschutz/naturschutzgebiete/flyer/flyer_altlaeufe_glatt.pdf
- Fischer, L[ukas], C[hristian] Heimgartner, A[lex] Stahel, A[nna] Hool, Metron Verkehrsplanung AG, Roland Müller Küsnacht AG, *Umfahrung Neeracherried, Höri und Niederglatt. Konzept von Seiten der Gemeinden Höri, Neer- ach und Niederglatt sowie BirdLife Schweiz*, Brugg 2017. https://www.neerach.ch/public/upload/assets/779/Konzept%20Umfahrung%2015\.03\.2017\.pdf?fp=2
- Fishman, Robert, Schlechtes Gewissen, gutes Geld und faule Kompromisse, in: *Deutschlandfunk Kultur*. 2020, https://www.deutschlandfunkkultur.de/co2-kompensation-schlechtes-gewissen-gutes-geld- und-faule-100.html
- Flughafen Zürich AG Umweltschutz (Hg.), *Flughafen Zürich Gewässerschutz*, Zürich-Flughafen 2019. https://www.flughafen-zuerich.ch/-/jssmedia/airport/portal/dokumente/das-unternehmen/politics-and-responsibility/environmental-protection/broschueren-und-positionspapiere/gewaesserschutz_2019_web.pdf?vs=1
- Flughafen Zürich AG Umweltschutz (Hg.), _ Natur und Landschaft, *Flughafen-Zürich 2020. https://www.flughafen-zuerich.ch/-/jssmedia/airport/portal/dokumente/das-unternehmen/politics-and-responsibility/environmental-protection/broschueren-und-positionspapiere/natur*und*landschaft*2020_web.pdf?vs=1
- Foundation myclimate (Hg.), *Moorland as a climate protector: renaturation of the Königsmoor in Schleswig-Holstein*, 2019. https://www.myclimate.org/information/carbon-offset-projects/detail-carbon-offset-projects/landuse-germany-7221/
- Foundation myclimate (Hg.), *Renaturation of Moorland in Schwändital*, 2021. https://www.myclimate.org/de/informieren/klimaschutzprojekte/detail-klimaschutzprojekte/landnutzung-schweiz-7823-001/
- Foundation myclimate (Hg.), *Renaturation of the Gelliner Bruch in Meckelnburg-Western Pomerania*, 2021. https://www.myclimate.org/information/carbon-offset-projects/detail-carbon-offset-projects/pdf/?tx_mcop_projectdetails%5Bproject%5D=344&tx_web2pdf_pi1%5Baction%5D=&tx_web2pdf_pi1%5Bargument%5D=printPage&tx_web2pdf_pi1%5Bcontroller%5D=Pdf&cHash=016fa47c01a229b9ab64ec2ec189ab9d
- Graf, Nicole, *Flughafen Kloten: Anatomie eines komplizierten Ortes*, 2018. https://blogs.ethz.ch/crowdsourcing/2018/05/11/flughafen-kloten-anatomie-eines-komplizierten-ortes/
- Güttler, N[ils], N[iki] Rhyner und [Max] Stadler (Hg.), Kloten erden – eine Einleitung, in: *Flughafen Kloten: Anatomie eines komplizierten Ortes*, Zürich 2018. https://aether.ethz.ch/ausgabe/flughafen-kloten/kloten-erden-eine-einleitung/

- Jäger, Hansjürg, Renaturierungspläne Flughafen Zürich: «Es geht um Existenzen», in: *Bauernzeitung*, 2017. https://www.bauernzeitung.ch/artikel/landwirtschaft/renaturierungsplaene-flughafen-zuerich-es-geht-um-existenzen-364531
- Kron, Ben, Naturparadies Flughafen Zürich: Pisten und Pirole, in: *Baublatt*, 2020. https://www.baublatt.ch/baubranche/naturparadies-flughafen-zuerich-pisten-und-pirole-29944
- Lenzinger, Stephan, Die Anbauschlacht, in: *dergartenbau*, 2014. http://menarvis.ch/uploads/media/1412og_anbauschlacht_lenz_gzd.pdf
- Neu, Urs und Swiss Academies Communications (Hg.), *Die Auswirkungen der Flugverkehrsemissionen auf das Klima*. 2021, https://scnat.ch/de/uuid/i/81d6af2e-432d-5dff-b961-b50e788704e8-Die_Auswirkungen_der_Flugverkehrsemissionen_auf_das_Klima
- Pillet, Stéphane Bundesamt für Umwelt (Hg.) und Bundesamt für Zivilluftfahrt (Hg.), *Biodiversität und ökologischer Ausgleich auf Flugplätzen*, Bern 2019. https://www.bafu.admin.ch/bafu/de/home/themen/biodiversitaet/publikationen-studien/publikationen/oekologischer-ausgleich-flugplaetze.html
- Reuschenbach, Monika, Die Geschichte des Flughafens Zürich-Kloten. Entwicklungen in 60 Jahren, in, *Spuren – Horizonte*.
- Schürer, Andreas, Professor Klötzli kämpft für die Moore, in: *Neue Zürcher Zeitung*, 2017. https://www.nzz.ch/zuerich/flughafen-zuerich-professor-kloetzli-kaempft-fuer-die-moore-ld.1302154
- Statistisches Amt Kanton Zürich (Hg.), *Nutzungswandel*. https://www.zh.ch/de/planen-bauen/raumplanung/daten-raum-und-siedlung/bodennutzung.html
- Walker, Andreas und Baudirektion Kanton Zürich (Hg.), *Naturschutz-Gesamtkonzept: Bilanz 2015 und weitere Umsetzung*. https://www.zh.ch/de/umwelt-tiere/naturschutz.html
- Zielke, Jochen, Nasse Bewirtschaftung von Moorflächen, in: *planetwissen WDR*, 2018. https://www.planet-wissen.de/natur/landschaften/lebensraum_moor/paludikultur-100\.html

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