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OpenSpaceAlps PLANNING HANDBOOK

Perspectives for consistent safeguarding
of open spaces in the Alpine region



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of open spaces in the Alpine region

May 2022

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ABSTRACT

In the Alpine region, the continuous consumption of open spaces for settlement areas and technical infrastructure and the associated soil sealing can be observed. This leads primarily to the loss of agricultural land. Depending on the extent of development, there is also increased landscape fragmentation, which is associated with the isolation of natural habitats and the restriction of ecological connectivity, as well as other negative consequences.

The OpenSpaceAlps project has addressed this issue and, based on cooperative procedures in several pilot regions, has developed approaches and solution strategies for the sustainable safeguarding of open spaces. This handbook supports the activities and decision-making of various stakeholders, first and foremost planners in public planning authorities. Based on an analysis of the challenges and framework conditions in the Alpine region, the handbook presents and compares central “principles” of open space planning. Furthermore, integrated planning strategies for different spatial categories are discussed.

NOTE

This handbook has been produced as an output of the Interreg Alpine Space project “OpenSpaceAlps” (Sustainable Development of Alpine Open Spaces by Enhancing Spatial Planning Governance), which was co-financed by the European Regional Development Fund (ERDF) through the Alpine Space Programme. The content of this handbook is the responsibility of the respective authors and does not necessarily reflect the views of the Alpine Space Programme. The handbook is available in English, German, French, Italian and Slovenian. Digital versions of the document can be downloaded from the project website. For printed copies, please contact the partner organisation in your country.



1.

INTRODUCTION AND BACKGROUND

1.1 The OpenSpaceAlps project

The main objective of OpenSpaceAlps (“Sustainable Development of Alpine Open Spaces by Enhancing Spatial Planning Governance”) is to contribute to the sustainable development of the Alpine Space with spatial planning strategies for the long-term safeguarding of open spaces and their valuable features. Six partner organisations (see Fig. 1) and numerous observer organisations worked together in the OpenSpaceAlps project consortium. The questions and approaches were dealt with on the basis of six pilot regions considered from a transnational perspective, whereby attention was paid to the close involvement of regional, national and international stakeholders, e.g. in several workshop rounds. This document is one of four central “outputs” of the OpenSpaceAlps project:

- this **Alpine open space planning handbook**
- **strategic (policy) recommendations** to promote the sustainable development of Alpine open spaces
- an **Alpine-wide visualisation of open space structures**
- the **AlpPlan network**, bringing together representatives of spatial and sectoral planning as well as planning research from all Alpine countries

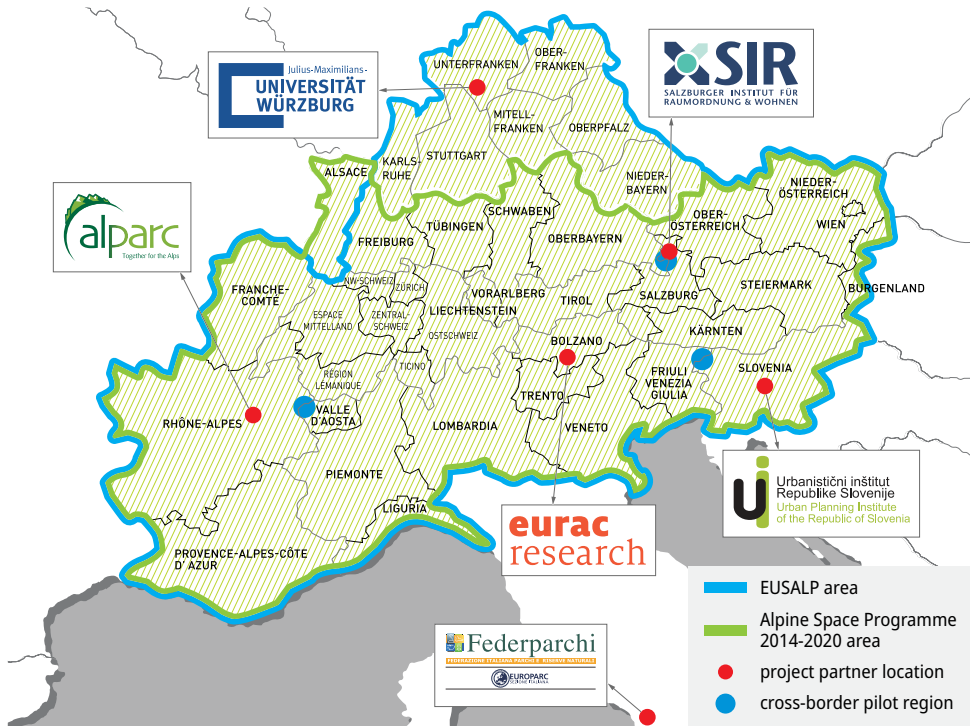


Fig. 1: Partner organisations of the OpenSpaceAlps project (J. Andrić, P. Peterca) [1]

The aspirations of the OpenSpaceAlps project and the cooperation processes it has initiated can be summarised in the following **vision**:

OpenSpaceAlps strengthens the overall coordinating role of spatial planning with all the components of sustainable territorial development relevant to open spaces for generations to come. In 2030 spatial planners, economists and ecologists will work together to find the best way to use available land and maintain open space on the basis of common criteria and a common understanding. The coming generations will then be able to decide themselves how to use unbuilt space in the future.

Watch the project video
"OpenSpaceAlps - for generations to come" on Youtube:
<https://youtu.be/pEA1srr3DYA>



1.2 Conception of the handbook

As a European Interreg project, OpenSpaceAlps tackles the task of promoting the transnational exchange of application-oriented knowledge and developing a basis for the transfer of suitable solutions in the field of spatial planning and development. To achieve these objectives, it is necessary to critically reflect on the nature of dominant notions, above all the role of best practices for policy transfer. In the planning literature, there are relevant contributions to the debate on the **criticism of the dissemination of best practices** in the context of European cooperation programmes (Stead 2012; Pojani & Stead 2015; Vettoretto 2009). At the heart of the critique is the widespread assumption that “best” planning practices/instruments are equally applicable and effective in different institutional frameworks, and thus could be more or less directly “transferred” (Stead 2012). The different European planning systems and cultures are comparable in their basic features in the Alpine Space (cf. Chapter 2.4) but represent a challenge for direct policy transfer. Drawing on these assumptions, the OpenSpaceAlps project focuses on the **elaboration of individual transferable components of good planning practices** as well as on **transnationally applicable planning principles**.

This handbook is not the result of purely theoretical considerations. It was rather developed taking into account the diversity of spatial planning instruments related to the safeguarding of open spaces in the Alpine region. Based on the comparative study of spatial planning practice in the Alpine Space, **planning principles and integrated planning strategies** are elaborated and presented here. These are intended to **support relevant actors in designing or enhancing regionally/locally adapted planning strategies**. The aim is to increase the **quality of planning** by integrating the functions of open spaces as well as their location and structure more consistently into planning practice. The concept of the **dimensions of planning quality** according to Stöglehner (2019, cf. Fig. 2) is included and applied to the planning principles presented. Four dimensions (incl. guiding questions) are identified:

- **Planning content:** Does planning adequately address issues that relate to the relevant (legal) principles of sustainable and balanced spatial development?

- **Planning methodology:** Are adequate and scientifically sound methods used in the planning process to shape the planning content?
- **Planning process:** Are all relevant stakeholders as well as the public adequately involved in the planning process?
- **Legal conformity of planning:** Are the legal requirements for the other three dimensions complied with, in particular by correctly weighing up and balancing the relevant concerns? What legal effect does the planning have?

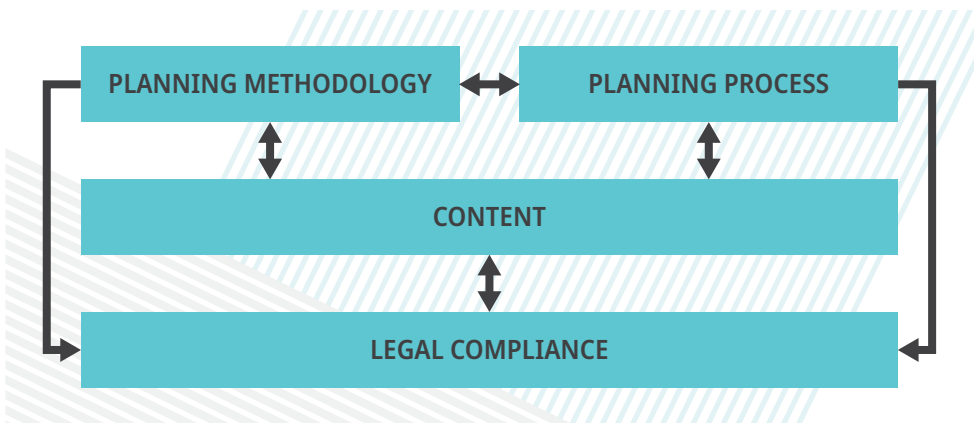


Fig. 2: Dimensions of planning quality (Stöglehner 2019: 9, adapted) [2]

This **handbook is divided into six chapters**. Chapters 1 and 2 inform about the background of the handbook, basic concepts and definitions as well as specific challenges for spatial planning. Chapter 3 presents and compares the central planning principles for safeguarding open spaces identified by the OpenSpaceAlps project. As these should not only be considered individually but also in combination with other spatial planning and management approaches, Chapter 4 gives an overview of integrated spatial planning strategies for different spatial/landscape types in the Alpine Space. Subsequently, Chapter 5 discusses important framework conditions for the success of planning interventions in the sense of a holistic “governance” approach, before Chapter 6 draws conclusions. In addition, at the end of the handbook there is a glossary of relevant terms used. The findings and recommendations were

developed in various formats within the OpenSpaceAlps project. These include, in particular, stakeholder workshops in the pilot regions and transnational cross-border case studies, interviews with experts from all countries of the Alpine Space and comparative document analyses.

1.3 Who is this handbook for?

This handbook is aimed at all stakeholders involved in the preparation, conception, implementation and monitoring of open space planning strategies. Even though the regional level is considered to play a particularly important role in the safeguarding of interconnected open spaces, all spatial/administrative levels are addressed. The following are particularly relevant groups of stakeholders:

- Local planning authorities
- Regional planning authorities
- Private planning offices
- National/regional authorities and ministries
- Dedicated decision-makers at municipal/regional level
- Universities and colleges with institutes/degree courses in relevant disciplines (e.g. spatial planning, landscape planning, landscape architecture, geography)



2.

CONTEXT OF OPEN SPACE PLANNING IN THE ALPINE REGION

Why is it necessary to safeguard open spaces in the Alpine Space through spatial and landscape planning? Which planning levels and databases are suitable for this purpose? This chapter provides an overview of central definitions, methods and challenges that provide an important context for the normative recommendations in the following chapters. The specific open space functions form the background to open space planning. However, certain functions are only effective if the respective areas are spatially and functionally connected to other open spaces, e.g. as a supra-local biotope network. Therefore, open space planning should not only be the responsibility of municipalities but should also be considered in supra-local spatial planning.

2.1 Definitions and open space functions

Open space is not a fixed term in itself; it must be carefully used in the respective disciplinary context. In countries such as Germany¹ and Austria, open space is a term anchored in the legal basis of spatial planning or in political spatial development strategies. However, in other countries of the Alpine Space this term is less common or refers only to inner-urban open spaces. As a first basic definition, open space can be considered as an area that is free from strong anthropogenic intervention and thus allows for the area-bound functions of ecosystems and landscapes (Maruani & Amit-Cohen 2007). Strong anthropogenic intervention is primarily considered to involve the construction of built structures and soil sealing. Other forms of human land use, e.g. agricultural use, also have a considerable influence on the natural characteristics and processes of an area, but are generally considered to be compatible with open space. Thus, the concept of open space used for spatial planning is not about the absence of human use (in the sense of “wilderness”), but about limiting intensive (built/technical) forms of land use.

In order to be able to comparatively analyse the structure and distribution of

¹ For a presentation translated into English on the planning concept of open space in Germany, see https://www.arl-international.com/sites/default/files/dictionary/2021-09/open_space.pdf (14.12.2021).

open spaces in the Alpine region, the OpenSpaceAlps project has developed a specific definition following Job et al. (2017; 2020) (translated from Job & Meyer 2019):

Open spaces comprise areas outside housing/settlement areas, commercial/industrial areas and other special designated areas (e.g. golf courses and leisure parks) that are kept free from building developments of any kind, which are not predominantly developed (punctual, linear or planar infrastructure) and are widely free of soil sealing, ideally free of traffic or largely reserved for non-motorised traffic and thus “noise-free”. Technical infrastructures not belonging to the landscape structure are either non-existent or hardly existent.

This definition was drafted mainly with a view to the geoinformatic analysis of open space structures in the Alpine region carried out in the project (cf. Chapter 2.3). In order to make it usable for spatial planning practice, three levels of definition can be distinguished (cf. Table 1). The first level corresponds to the “intuitive” understanding of open space and is defined by the pure absence of buildings, technical infrastructure and soil sealing. For the second level, further criteria are added, namely the extra-urban location and the (low) influence of human emissions such as traffic noise. For the third level, a change of perspective to the level of large-scale landscape areas (“landscape chambers” such as Alpine valleys) is necessary. For this purpose, the degree of development and an associated threshold value are calculated using spatial science methods (cf. Chapter 2.3) and serve to record and map (comparatively) little developed landscape areas.

Tab. 1: **Levels of definition of open space**

1st definition level	Area kept free of buildings, technical infrastructure and soil sealing
2nd definition level	Area outside closed settlements, commercial and industrial areas and other special designated areas that are also kept free of noise and other disruptive anthropogenic effects (emissions)
3rd definition level	Landscape area that is largely undeveloped (threshold-dependent) in terms of technical infrastructure, soil sealing and motorised traffic as well as their disruptive effects

Tab. 2: Overview of open space functions in relation to ES categories

Open space functions					
		Ecological	Economic	Social functions	
Eco-system services (CICES ²)	Provisioning	(core) habitat provision ecological connectivity (habitat links) soil formation	agricultural use forestry use biomass production	food production/supply (raw material supply)	
	Regulation & maintenance	ecological regulation (e.g. water, nutrient flows)	freshwater purification	natural hazard prevention (e.g. flood retention) noise emission control	
	Cultural	natural monuments	nature-based tourism	outdoor recreation unique landscapes (regional identity)	
Cross-cutting functions					
climate change mitigation (e.g. terrestrial carbon storage) climate change adaptation (e.g. flood retention, cold air flow, corridors for species migration)					

The present definition is a **negative definition** that uses various **exclusion criteria to delimit open spaces**. This is mainly due to the easier implementation in Geographic Information Systems (GIS) and the better transnational data availability for buildings and technical infrastructure. However, open spaces should not be understood as “residual spaces”. Building on the approaches of Green Infrastructure (GI) and Ecosystem Services (ES), open spaces can also be defined in terms of their specific **functions or services for the environment (ecosystems), economy and society**. Table 2 shows a selection of relevant open space functions, differentiated according to ecological, economic and

² Common International Classification of Ecosystem Services (CICES): <https://biodiversity.europa.eu/ecosystems/mapping-and-assessment-of-ecosystems-and-their-services-maes-1/common-international-classification-of-ecosystem-services-cices> (14.12.2021)

social functions as well as provisioning, regulation and cultural ecosystem services.

In this handbook, open space planning refers to the incorporation of the structure, qualities and functions of open spaces in spatial planning. It is also regarded as an integrated component of comprehensive spatial planning. Spatial planning is defined here as follows (ARL 2021):

[Spatial planning] refers to the comprehensive, supra-local and superordinate tier of planning the structure and development of space. The attribute “comprehensive” emphasises the function of co-ordinating and harmonising those elements of the various types of sectoral planning which have spatial impacts. “Supra-local” indicates that the territory affected by this tier of planning extends beyond the boundaries and jurisdictions of local authorities. The “superordinate” character of spatial planning is a reflection of the power of central government to play an all-embracing and co-ordinating role with regard to planning by virtue of its sovereign powers for the entire national territory [...].

Planning for open spaces is referred to as “**safeguarding open spaces**” in this handbook, as it involves safeguarding specific open space functions as well as unbuilt “opportunity spaces” for future generations. The specific approaches to open space planning depend on the type of land use in the open space. **Two dominant notions** can be distinguished here: first, planning to secure specific services relevant to society and, second, planning to preserve the intrinsic values of natural/near-natural areas or ecosystems (Maruani & Amit-Cohen 2007). The planning principles outlined in Chapter 3 provide examples of both notions, although they can also be integrated to some extent. The debate on Green Infrastructure (GI) planning in particular has suggested that functions and ecosystem services should not be considered in isolation, but that the focus should rather be on planning strategies that emphasise the **multifunctionality of open spaces** in order to avoid land use competition as far as possible.

2.2 Specific challenges in the Alpine region

In the Alpine region, there is a particular need for action to safeguard open space in spatial planning. In addition to the strong impact of climate change, the sensitivity of Alpine ecosystems, numerous geohazards and the scarcity of potential permanent settlement space lead to diverse land use conflicts that require coordinated spatial planning (EEA 2016a; Marzelli 2010). Basically, two opposing trends can be observed. While many peripheral areas are characterised by population decline and an abandonment of agricultural use, processes of urbanisation and urban sprawl can be observed in intensively used (valley) areas (Bätzing 2015). These processes are often accompanied by a loss of agricultural land, which is limited anyway, both through urbanisation and through the abandonment of agricultural use and subsequent reforestation (EEA 2016a).

In addition, in some of the Alpine municipalities the development of technologically advanced leisure facilities and ski resorts in (high) mountain areas threatens open spaces. In many places, hybrid forms of accommodation (e.g. chalet villages, resorts, apartment buildings, etc.) are increasingly appearing alongside the land requirements of “classic” tourism infrastructure and accommodation as well as locally induced settlement development. In some regions of the Alpine Space, second homes in particular are a significant factor in demand for building land, although these are concentrated in relatively few Alpine municipalities (Sonderegger & Bätzing 2013). Tourism structures are unevenly distributed and in some cases challenged by high seasonality, climatic change and land use competition in the limited permanent settlement area (Elmi 2019), which suggests that supra-local management of tourism development by spatial planning would be appropriate.

In the Alpine region, it is also clear that open space planning at the local level within the framework of municipal land use planning alone is insufficient. For example, the Interreg Alpine Space project *ALPBIONET2030* has identified strategically important areas, corridors and barriers – some of which are transnational and transregional – which are highly relevant for the preservation of ecological connectivity in the Alpine Space (ALPARC 2019). Spatial planning plays an important role in ensuring structural and functional connectivity in

the sense of coherent green infrastructure (GI) planning. Although the quantitative potential of GI and its services is large in the Alpine Space, Alpine protected areas contribute relatively little to securing total GI potential (Alpine Space Programme 2021), mainly due to the large shares of rock-covered high mountain areas. In addition, ongoing climate change must be taken into account in several respects. For example, it will lead to a shift in the distribution range of threatened species, so that their focal points may no longer lie within existing protected areas. It also increases the risk of (alpine) natural hazards, such as landslides, rockfall or flooding.

From a European perspective, the following factors can be summarised as the most significant “threats & pressures”³ for ES, which can also be applied to the Alpine region (Egarter Vigl et al. 2021):

- Climate change
- Invasive species
- Fragmentation
- Land use change
- Pollution
- Overexploitation

Even though there are manifold needs for action in spatial planning, the “starting points” in the Alpine Space are very distinct. In order to consider the application and combinations of planning approaches in a differentiated fashion, a spatial typology was designed for this handbook (cf. Fig. 3). Based on this typology, aligned strategies for open space planning are presented and discussed in Chapter 4, and address the specific challenges outlined in the sub-chapters.

³ <https://biodiversity.europa.eu/threats> (21.12.2021)

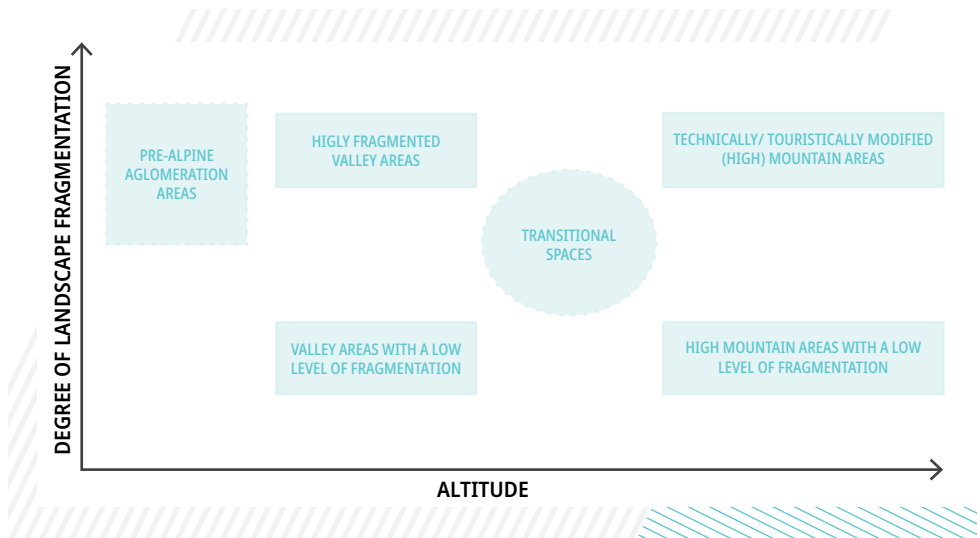


Fig. 3: Spatial typology for deriving specific planning strategies in Chapter 4
(C. Meyer, P. Peterca) [3]

2.3 Mapping of open spaces: scales, data and mapping methods

The analysis of the status quo is an important prerequisite for planning decisions. Processing and analysis in Geographic Information Systems (GIS) provides valuable planning support. In principle, this analysis can be carried out at different scales: Table 3 shows this schematically for the supra-regional, regional and local levels. Both an exclusion-based approach (via the analysis and modelling of built-up areas, infrastructure and disruptive factors) and an open space-based approach (via the analysis of concrete open spaces and their modelled functions) can be chosen. The closer the issue or planning mandate is to the local level, the more strongly an analysis of concrete open spaces and their specific importance for the local population (e.g. for local recreation or climate regulation) is recommended.

The mapping of the OpenSpaceAlps project was developed using two complementary approaches. The first is an analysis based on the identification of a selection of infrastructure components and the spatial disruption produced by their presence. The second approach focuses on the definition of common criteria as a result of internal and external exchanges between experts to better characterise the spaces with a low level of development and to identify the activities that threaten their conservation. The data availability and uniformity of the data was tested at the project's pilot sites: the Mont Blanc region between Italy and France, the Prealpi Giulie Nature Park and the Triglav National Park at the national border between Italy and Slovenia and the Berchtesgadener Land Biosphere Region (D) with the Tennengau region (A) in the federal state of Salzburg. This work was followed by a second phase of information gathering and processing on a supra-regional level (EUSALP).

Tab. 3: **Purpose and methods of open space mapping at different scales**

Scale	Purpose of the analysis	Methods and data
Supra-regional (Alpine-wide)	Identification of large-scale structures and patterns	<p>Identification of infrastructurally little developed landscape areas (e.g. hydrological catchment areas) in an interregional comparison.</p> <p>Buffering of buildings and infrastructure according to their assumed disruptive effect and calculation of the spatially effective degree of development (cf. Nischik & Pütz 2018).</p> <p>Establishing a minimum size for continuous open spaces (e.g. 10 ha).</p> <p>Data: Pan-European geodata, e.g. from Copernicus Land Monitoring Service or via OpenStreetMap.</p>

Scale	Purpose of the analysis	Methods and data
Regional	Identification of supra-locally relevant open space structures with special priority	<p>Identification and evaluation of regional open space networks with special significance (e.g. as a biotope network, for local recreation or for cold air production and corridors).</p> <p>In the thematic focus Biodiversity and Ecological Connectivity: identification of core/priority areas and connecting elements/corridors.</p> <p>Data: official regional geodata on land use and selected specialist topics (e.g. natural hazards); biotope and functional landscape mapping; statistics on selected topics (e.g. tourist visitor frequency).</p>
Local	Identification of locally relevant open spaces and their specific functions	<p>Comprehensive description and assessment of open spaces at the municipal level with regard to their specific functions for local people and ecosystems.</p> <p>Establishing content-related links to the significance of supra-local open space structures.</p> <p>Data: official land use registers, biotope and functional landscape mapping, qualitative data (e.g. interviews, surveys and public consultation).</p>

The cartographic analysis, identifying open spaces on the scale of the entire Alps, can be seen as an inventory of large-scale near-natural areas. The method identifies the degree of infrastructural development of spatial landscape units (hydrological catchment areas) (cf. Fig. 4). Within the EUSALP perimeter (Alpine macroregion), 29 % of the area has been identified as near-natural in the sense that the respective spatial units feature a degree of infrastructural development of less than 20 % (green areas on the map) and therefore a high share (more than 80 %) of (large-scale continuous) open spaces. Most of these areas are located within the Alpine Convention perimeter.

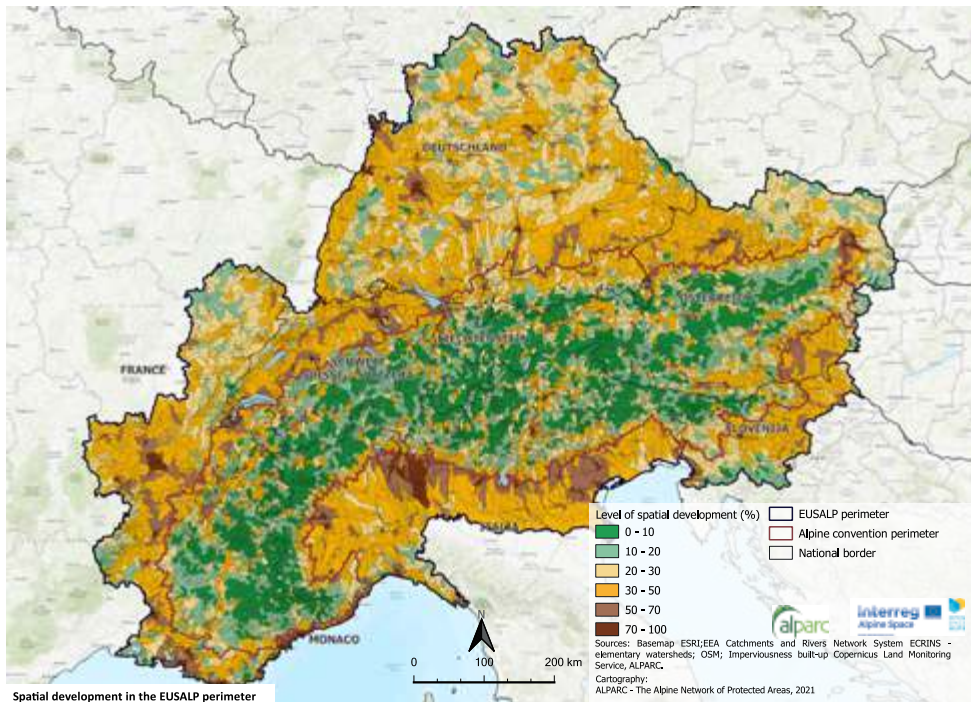


Fig. 4: Alpine-wide analysis of the degree of development with buildings and technical infrastructure (ALPARC 2021a) [4]

2.4 Spatial planning control and open space safeguarding

Spatial planning can be located at different scales, as Figure 5 illustrates. These range from the supra-national level (e.g. through European spatial development policy) to specific planning in the municipality. Spatial planning is thus embedded in a multi-level system, in which the different planning levels and bodies influence and interact with each other whilst performing different planning tasks according to the degree of concretisation. Within the framework of the OpenSpaceAlps project, legal bases, strategies and planning instruments were compared at the schematic administrative levels of “national”,

“federal state/canton”, “region/province”, “agglomeration/metropolitan area”, and “municipality association” and “municipalities”. Considering the existing legal spatial planning competencies is important, as the planning systems in the Alpine Space differ considerably in some cases despite certain commonalities. For a more detailed comparison, please refer to OpenSpaceAlps Deliverable D.T1.1.2 “Catalogue on current planning approaches”.

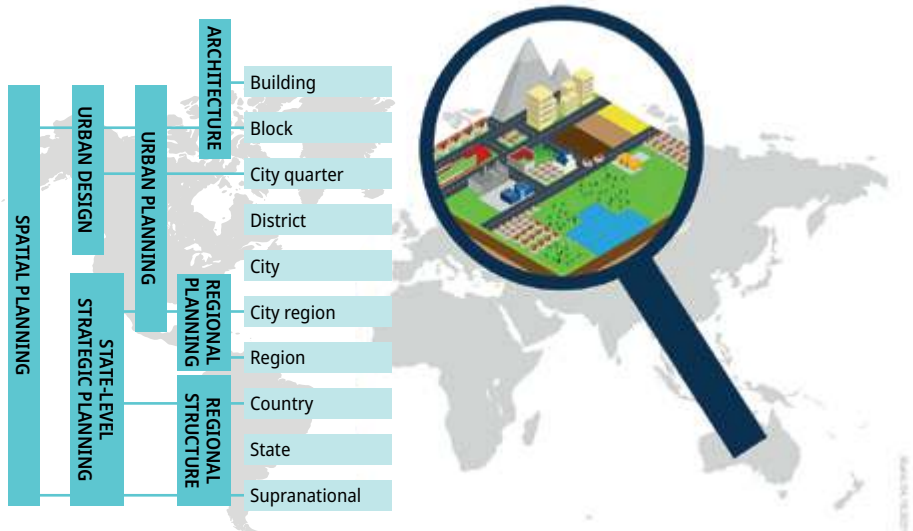


Fig. 5: Intervention levels of spatial planning (TU Dortmund University, Department of Spatial Planning 2021) [5]

Of the seven countries shown, only Switzerland, Slovenia and Liechtenstein have relevant formal spatial planning competences at the national level. To some extent, legislation at the national level, has an influence on the subordinate planning levels also in other countries. In the countries where there are federal states or cantons (Germany, Austria and Switzerland), these have both planning and legislative competences. The regions as well as the autonomous provinces play an important role especially in Italy and France. In contrast, the planning regions in Germany and Austria are rather small and represent regional planning associations that elaborate regional plans. In Slovenia, the preparation of regional spatial plans is provided for in the Spatial Planning

Act, but such plans have not yet been implemented. The level of metropolitan regions/agglomerations exists only in France and Italy, with the instruments *SCoT* (France) and *Piano Strategico Metropolitan* (Italy). In all Alpine countries, municipalities (or obligatory inter-municipal associations) are responsible for local (land use) planning, even in the Principality of Liechtenstein with its eleven municipalities. The differences in the structure of planning systems in the various Alpine countries emphasise once again the need to focus on “planning principles” rather than concrete instruments, as the former are applicable in different legal and institutional contexts.

Tab. 4: **Comparison of the relevant spatial planning competences in the states of the Alpine region**

Relevant legal planning competence (administrative planning levels)	DE	AT	CH	FR	IT	SLO	LIE
National level	(x)		x	(x)	(x)	x	x
State/canton	x	x	x				
Region/province	x	x		x	x	(x)	
Agglomeration/metropolitan area			(x)	x	x		
Municipality (association)	x	x	x	x	x	x	x

x = direct/strong competence in spatial planning

(x) = indirect/limited competence in spatial planning



3.

OPEN SPACE PLANNING PRINCIPLES - COMPARISON AND EVALUATION

The specific instruments of spatial planning differ between the states and regions in the Alpine Space. However, commonalities can be identified in the form of “principles”, which form the basis of spatial planning decisions. This handbook compares the most important planning principles that determine which areas are deliberately kept free from building and infrastructure development, and thus safeguarded for certain open space functions. The principles presented should not be interpreted individually, but in combination, taking into account different overlapping open space functions. Other (sectoral) policy fields are also important for the sustainable development of open spaces – first and foremost nature conservation for the protection of individual species and important habitats. In order to emphasise the character of comprehensive coordination by spatial planning, the spatial planning approaches presented are to be understood as complementary to sectoral approaches.

Planning principle

PLANNING TO SAFEGUARD AGRICULTURAL PRODUCTION



Description

Ensuring a sufficient amount of agricultural land by preventing its conversion into building land

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Agricultural production, food supply (main effects)

Settlement structures, ecological connectivity, landscape scenery (side effects)

Planning content

Designation of agricultural land with (comparatively) high soil productivity in local and/or regional planning documents, ensuring its preservation

Planning methodology

Identification of suitable areas by combining criteria such as soil productivity index, size, slope, location and structure of the land, type of agricultural production (grassland, arable land)

Planning process

Discussing relevant criteria → Analysing and identifying specific areas → Broad participation of authorities and the public (with special consideration of land-owners) and, if necessary, adaptation of the draft → Formal incorporation in planning documents → Regular evaluation and, if necessary, revision

Legal compliance

Legal incorporation usually at a higher planning level (e.g. in regional spatial plans), whose specifications must then be complied with at the level of municipal land use planning (no designation of other land uses) or can be concretised through municipal planning

Strengths/Opportunities

Through planning for agricultural areas, large contiguous open spaces in the permanent settlement space can be kept free and the food security of the population can be ensured. Despite the state intervention, municipalities and farmers/owners retain a certain degree of flexibility, as specific agricultural uses are not prescribed and the construction of certain buildings (e.g. agricultural out-buildings) may still be permitted.

.....

Weaknesses/Risks

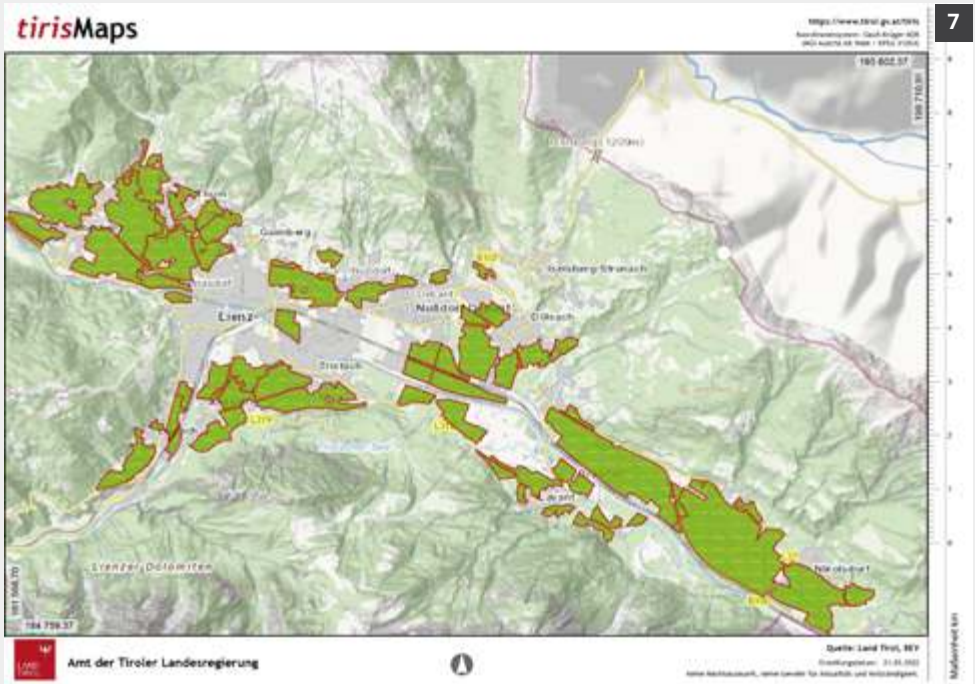
In inner-Alpine regions, areas with appropriate agricultural quality are usually only found in the valley areas of the permanent settlement space. Planning can preclude construction activities without influencing agricultural practice, but the latter can nevertheless have negative ecological effects. However, planning can at least indirectly affect agriculture by determining the use of adjacent plots, which can negatively affect the soil quality of agricultural land (airborne pollution from transport infrastructure, industrial areas etc.). The large-scale designation of agricultural priority areas limits the development possibilities of municipalities and is therefore a controversial issue among certain members of the public and municipal decision-makers.

Potential transferability

Transferability is possible, especially since corresponding databases on agricultural soil quality are available in most states. The definition of priority areas for agricultural production is not necessarily linked to a specific planning level and can thus be transferred to different planning systems.

Example: Planning for Agricultural Provision Areas in Tyrol (AT)

In the Austrian federal state of Tyrol, so-called Agricultural Provision Areas ("*Landwirtschaftliche Vorsorgeflächen*") have been designated in the regional programmes. They serve to ensure food security and to preserve agricultural structures and the cultural landscape. Areas were selected as provision areas that have a soil climate index of at least 25 (the threshold value varies depending on the region), are at least 4 ha in size, are located on terrain that is not too steep (less than 35 % slope inclination) and are outside continuous settlement areas. Municipalities may only designate land uses compatible with agriculture in these areas



Source: Amt der Tiroler Landesregierung 2017, 2022a

Planning principle

PLANNING FOR THE PREVENTION OF NATURAL HAZARDS



Description

Protect the population and buildings from natural hazards by keeping endangered areas undeveloped

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Natural hazard prevention (main effect)

Climate change adaptation, landscape scenery (side effects)

Planning content

Designation of areas that are to be kept free from buildings and certain infrastructures in order to protect them from natural hazards, such as floods, rock-falls/landslides (mass movements), debris flows/mudflows, avalanches

Planning methodology

Delimitation of endangered areas through on-site surveys (geological/geomorphological methods) and computer-based modelling (hydrological/climatological methods) → in the future, increasingly including climate-change-induced scenarios

Planning process

Defining investigated natural hazards and indicators/thresholds → if necessary, supplemented by on-site sampling/investigation (taking into account past hazard events) → area-wide delimitation/modelling → consulting public authorities and the public → binding incorporation in planning documents → regular evaluation and adjustment if necessary

Legal compliance

Legally binding implementation possible at different planning levels (especially for municipal land use planning and building permit procedures), graduated into zones of different risk intensity (absolute building bans vs. case-by-case consideration) → definition of criteria and procedures in legislation necessary

Strengths/Opportunities

In addition to the protection of the population, keeping endangered areas free also offers a cost advantage, as “nature-based solutions” (e.g. flood retention areas) often incur lower public costs compared to the costs of reconstruction or complex technical safety measures. Since there are often uncertainties in the risk assessment and the safeguarding of unbuilt land offers synergies with other open space functions (e.g. local recreation or agriculture), generous land use designations for hazard zones in the sense of “no-regret” strategies are recommended.

Weaknesses/Risks

The area-wide designation of hazard zones often involves only very rough estimates, as validation “on the ground” is cost- and time-intensive. The uncertainties caused by complex interactions and climate change (extreme events) may lead to “false certainties” in the exact delimitation of hazard zones in planning. Moreover, endangered areas have already been built upon in some places. Therefore, a combination of keeping areas undeveloped and technical safety measures (dams, protective walls, etc.) is necessary.

Potential transferability

Hazard zone planning is widespread and the methods are very similar in principle, which facilitates the transferability of good examples. In addition, the results of numerous Interreg projects (e.g. CLISP, RocktheAlps), the “PLANALP” working group of the Alpine Convention and the EUSALP Action Group 8 can be used for further development.

Example: Hazard zone planning in South Tyrol (IT)

The autonomous province of Bolzano-South Tyrol obliges its municipalities to draw up so-called Hazard Zone Plans, which identify hydrogeological hazards for settlements and infrastructure. The hazard zones are marked with different colours (red, blue, yellow, grey) depending on the hazard risk level. The different risk levels impose restrictions on building activities and the designation of building zones. The Hazard Zone Plans are binding and take precedence over planning instruments at the municipal level.



Source: Autonome Provinz Bozen-Südtirol 2021

Planning principle

PLANNING TO SECURE/RESTORE ECOLOGICAL CONNECTIVITY

10



Description

Safeguarding areas that are important for the connectivity of habitats of Alpine fauna and flora by keeping them free from land uses with barrier effects

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal
---------------	----------	---------------	----------	-----------------	-----------

Addressed open space functions

Ecological connectivity (main effect)

Local recreation, natural hazard prevention, ecological regulation (side effects)

Planning content

Keeping areas undeveloped that are important for ecological/biotope networks, such as core habitats, stepping stone biotopes, corridors

Planning methodology

Different methods available, depending on spatial scale, objective and available data: on transnational scale e.g. Continuum Suitability Index (CSI) (Haller 2016) and Strategic Alpine Connectivity Areas (ALPARC 2019)

Planning process

Defining the objective (structural or functional connectivity) → Data-based analysis and area-wide modelling → Validation by experts → Drafting related planning specifications (e.g. safeguarding corridors in valley areas) → Consulting authorities and the public → Binding implementation in planning documents → Regular evaluation and adjustment if necessary

Legal compliance

Designation of areas or corridors for which the “permeability” of the landscape (e.g. for certain wildlife) is to be ensured/established by planning: usually through specifications in regional/supra-local planning documents, which must be obeyed and concretised at municipal planning level

Strengths/Opportunities

Identifying regional or even (trans-)national ecological networks using the same criteria, allows spatial planning to be coordinated between countries and regions. At the same time, corresponding approaches offer potential for better coordination of nature conservation and spatial planning, which can complement each other in their institutional strengths.

Weaknesses/Risks

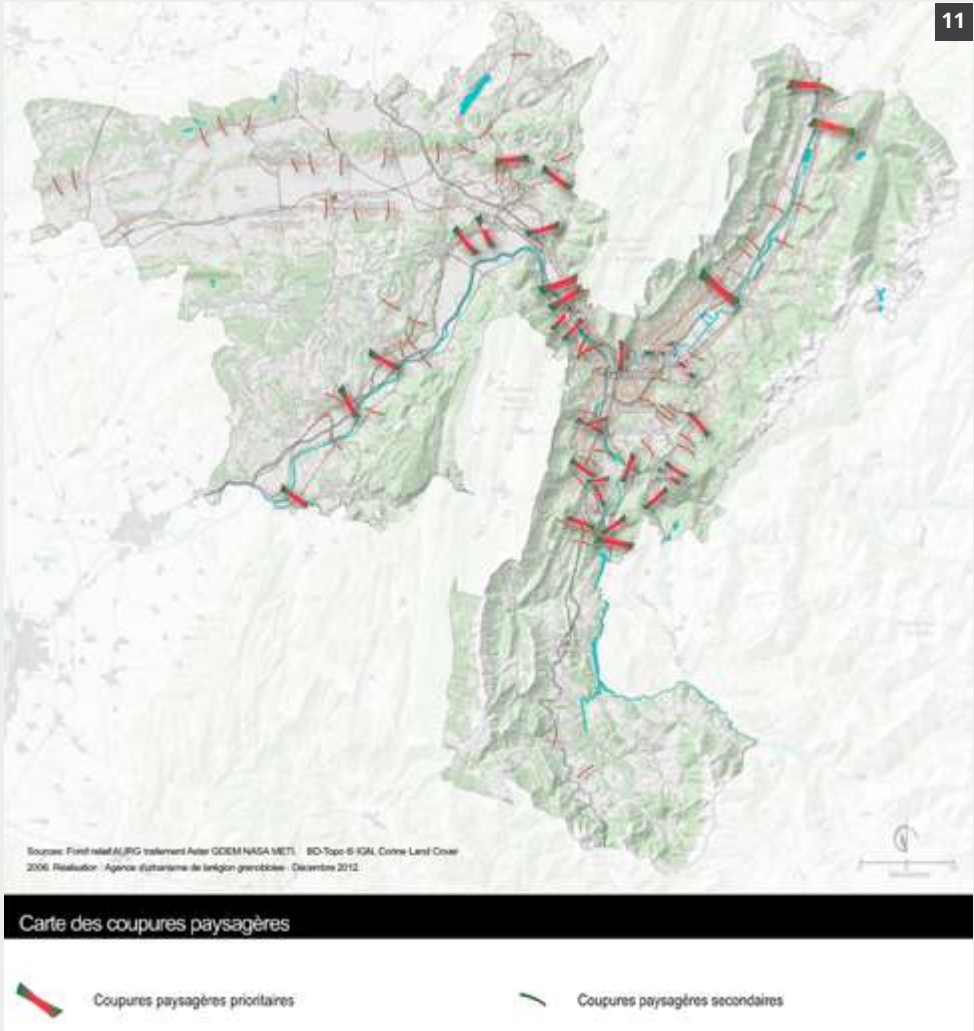
Structural connectivity, as an average measurement of the “permeability” of landscapes, is comparatively easy to determine on the basis of geodata. This is much more difficult for species-related requirements in the context of functional ecological connectivity. In addition, the capacity of spatial planning to affect concrete practices of land use (e.g. type and intensity of agriculture) differs among Alpine countries and regions. In some countries, spatial planning is mainly limited to influencing the location and development of settlement areas and buildings, which limits capacities to improve functional connectivity.

Potential transferability

For the analysis of ecological connectivity in the Alpine region, numerous project results (e.g. Interreg ASP projects “EConnect” and “ALPBIONET2030”) and knowledge bases (e.g. WebGIS “JECAMI”) exist that can contribute to transferability and cross-border harmonisation. However, the state of implementation in spatial planning documents and processes varies substantially and thus requires further harmonisation.

Example: Safeguarding of green corridors in the Grenoble agglomeration (FR)

In the Grenoble agglomeration, the development of linear urbanisation in the valleys, on the foothills and along the roads disrupts landscape structures and affects the circulation of animal and plant species in the area. The territorial coherence scheme (SCoT) therefore designates primary and secondary green corridors. Local spatial planning documents must stipulate the locations of these areas and classify them as agricultural or natural zones. Only the rehabilitation and extension of existing buildings or new buildings solely related to agricultural activities may be authorised. For secondary green corridors, urbanisation is theoretically possible, but the requirements of open and green spaces must be adequately considered in planning decisions.



Source: Agence d'urbanisme de la région grenobloise 2018

Planning principle

PLANNING FOR THE MANAGEMENT OF INTENSIVE TOURISM DEVELOPMENT



Description

Spatial planning management of technical development measures that are connected with intensive (mass) tourist use of landscape areas

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Nature-based tourism, landscape-based (local) recreation (main effects)

Landscape scenery, ecological connectivity (side effects)

Planning content

Targeted management or concentration of infrastructural development for tourism purposes (e.g. cable cars, ski lifts, car parks, large-scale leisure facilities) by defining development boundaries, priority areas and procedural criteria for expansion projects

Planning methodology

Definition of criteria for assessing whether areas should be developed with infrastructure for tourism purposes and under which circumstances/measures, especially with regard to nature conservation priorities, economic viability, knock-on effects of projects (e.g. traffic load) and climate change adaptation

Planning process

Participatory process (if necessary involving a continuous monitoring committee) with the participation of all relevant stakeholders (e.g. nature conservation associations, tourism/cable car industry, community representatives) → Legally binding incorporation in superordinate planning documents → Regular evaluation and adjustment if necessary

Legal compliance

Legal stipulation at higher level necessary (e.g. federal state, region) in order to be able to make assessments that are as neutral as possible, independent of local economic interests → resulting from the assessment process, spatial development plans with graphic representations of development areas/boundaries that are as concrete as possible

Strengths/Opportunities

If both concrete scope for expansion and development boundaries (e.g. for ski areas) are defined by supra-local planning documents, this creates long-term planning and decision-making certainty for municipalities and project developers. Furthermore, it safeguards sensitive natural areas from (mass) tourism use in the long term. Moreover, the requirements of the Alpine Convention (e.g. Art. 9 of the Tourism Protocol) can be implemented in this way.

Weaknesses/Risks

In regions where tourism and the cable car industry are of great importance, strong spatial control through state planning is rather controversial. Even if concrete planning specifications on a supra-local level are considered very effective for the long-term safeguarding of open space, this limits the flexibility of municipalities and operators. In addition, long-term forecasts for ski tourism are difficult due to rapid climate change in the Alps.

Potential transferability

Even if the spatial planning options for managing certain tourist infrastructures differ throughout the Alpine region, catalogues of criteria for the evaluation of infrastructure projects are easily transferable, for instance.

Example: Cableway and Ski Area Programme in Tyrol (AT)

The Tyrolean Cableway and Ski Area Programme (*Tiroler Seilbahn- und Skigebietsprogramm*) (TSSP), a spatial planning programme at the federal state level, is intended to regulate the new development and expansion of ski areas. In general, the new development of “terrain chambers” with cableway infrastructure for sports and leisure purposes is prohibited. For the expansion of existing ski areas, the programme provides exclusion criteria and positive criteria that should be considered in approval procedures. It was developed with the involvement of various interest groups. Environmental associations and the Alpine Club criticise the TSSP as insufficient and demand clearly defined development limits.



Planning principle

PLANNING OF RENEWABLE ENERGY INSTALLATIONS



Description

Spatial planning for renewable energy generation facilities that rely on a location in open space and contribute to the goals of the energy transition and climate neutrality

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal
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Addressed open space functions

Building use (energy generation) → Concentration of facilities enables the safeguarding of diverse open space functions in the areas that are kept undeveloped

Planning content

Targeted control or concentration of renewable energy plants (especially wind power, photovoltaics and hydropower) in order to achieve expansion targets and at the same time avoid the negative consequences of uncontrolled expansion

Planning methodology

Spatial analysis and assessment based on positive (for wind power, e.g. average wind levels, proximity to connectable power lines) and exclusion criteria (for wind power, e.g. protected areas, characteristic landscape features, distance to settlements, geohazards) as well as concrete expansion targets (e.g. target energy generation capacity and target number of wind turbines in the region)

Planning process

Defining assessment criteria → GIS analysis and delineation of potential suitability and exclusion areas → broad public participation and consultation of authorities (especially of municipalities and residents in affected areas) → adjustment and coordination with other planning objectives if necessary → legally binding incorporation in supra-local planning documents → regular evaluation and adjustment if necessary

Legal compliance

Coordination through supra-local/regional planning is necessary to define suitable and exclusion areas for large-scale renewable energy plants → mandatory incorporation in (local) approval procedures

Strengths/Opportunities

A supra-local/regional approach enables the targeted concentration of facilities in suitable areas, while the remaining open spaces are kept free of them. Targeted control, which also takes into account aspects such as landscape scenery, can thus increase acceptance among the local population for the urgently needed expansion of renewable energies. In addition, concentrating the energy plants lowers the costs for connections to supra-local electricity grids.

Weaknesses/Risks

In many inner-Alpine regions, there is little flexibility in the planning of appropriate plants due to the topography and the very limited permanent settlement space. Hydropower in particular is strongly site-dependent and larger projects involve strong intervention in the natural balance of Alpine watercourses.

Potential transferability

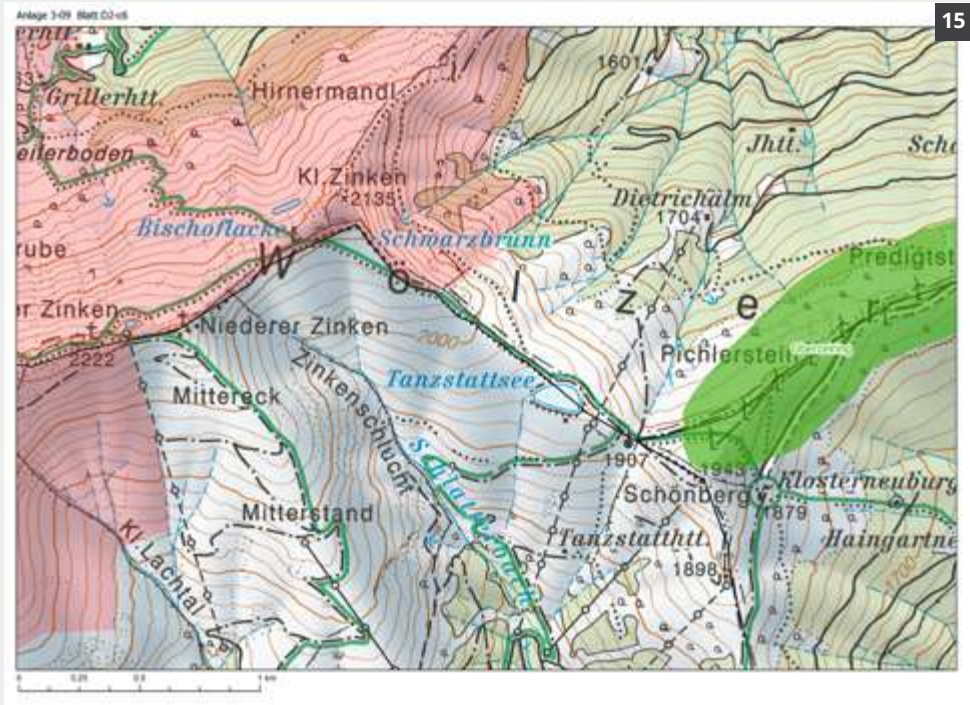
Potential transferability strongly depends on the respective planning system and the relationship of spatial planning and sectoral planning. If control and approval are only anchored at the municipal planning level, it may be possible to draw up regional concepts, which should then at least be taken into account in approval procedures at the municipal level.

Example: Sectoral Development Programme for Wind Energy in Styria (AT)

The Sectoral Development Programme for Wind Energy is an instrument on the federal state level for coordinating the requirements of energy supply, the economy and ecology/landscape conservation in Styria. In order to implement the objectives, exclusion zones, priority zones and suitable zones are stipulated with regard to the construction of wind turbines, whereby the following measures have been defined:

- Exclusion zones: the construction of wind power plants is not permitted
- Priority zones: new construction or expansion of wind farms possible in a concentrated form
- Suitable zones: as second-priority sites, also designated for the construction of wind power plants

The municipalities are to present priority zones as supra-local designations in the course of local spatial planning.



Source: Amt der Steiermärkischen Landesregierung 2022

Planning principle

PLANNING TO SAFEGUARD (LOCAL) OUTDOOR RECREATION



Description

Preventing development on open spaces (close to settlements) that are particularly suitable for the outdoor recreation of the local population

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Landscape-based recreation (main effect)

Nature-based tourism, local climate regulation, landscape scenery (side effects)

Planning content

Designation and safeguarding of open spaces (close to settlements) that are particularly suitable for (local) outdoor recreation due to certain characteristics, such as: beauty and diversity of the landscape, tranquillity (absence of noise), accessibility

Planning methodology

Delimiting appropriate areas in exchanges with the (local) population and their recreational behaviour (e.g. in citizens' workshops in the context of updating/redrafting municipal planning documents)

Planning process

Defining landscape-related objectives in the updating of planning documents → Including the preferences and recreational behaviour of the (local) population → Coordination with other planning stipulations and incorporation in planning documents

Legal compliance

Since areas suitable for recreational purposes often cannot be clearly defined, fuzzy definitions are also conceivable (e.g. as point signatures in spatial plans). These should be taken into account in the context of weighing up other concerns, without establishing an exclusionary effect for construction projects.

Strengths/Opportunities

The consideration of recreational spaces has a variety of positive effects on the health and well-being of the local population. Active participation of the population in planning processes can increase acceptance.

Weaknesses/Risks

The recreational preferences of different population groups (e.g. by age) sometimes differ and are therefore not always easy to reconcile. Furthermore, it is difficult to derive concrete (quantifiable) criteria for consideration in planning procedures.

Potential transferability

In principle, this planning principle is easily transferable as it can be implemented by involving the local population. However, the concrete criteria as well as the specific approach should be adapted to local specificities.

Example: Landscape planning for recreation in Italy/Friuli Venezia Giulia

The Italian landscape plans include plans for slow mobility to link the most important cultural and recreational sites and to provide access to the landscape for recreational purposes. The example of the Landscape Plan of Friuli Venezia Giulia shows that the actual status quo and future projects for a regional network were elaborated. It consists of the most important bicycle routes and footpaths of regional importance, and strategic features like intermodal public transport connections, or e.g. the upgrading of a high route for nature parks.



Source: Regione Autonoma Friuli Venezia Giulia 2020

Planning principle**PLANNING TO SAFEGUARD LOCAL/REGIONAL CLIMATIC COMPENSATION AREAS****Description**

Securing open spaces with special significance for the local/regional climatic situation free of obstructions

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal
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Addressed open space functions

Climate change adaptation, local climate regulation (main effects)

Local recreation, landscape scenery, natural hazard prevention (side effects)

Planning content

Designation and safeguarding of open spaces (close to settlements) which, as green spaces, play a special role in regulating the local and regional climatic situation (especially in densely populated areas), e.g. for the production and transport of cold air to avoid “heat islands” in settlement areas

Planning methodology

Analysis of relevant open spaces by means of micro-/mesoclimatic modelling (usually by commissioning specialised experts), if necessary supplemented by on-site climate measurements → Identification of different climatic functions and values of open spaces

Planning process

Compiling available data and information → Commissioning a regional/local climate analysis/modelling by experts → Presenting the results and coordinating with other spatial development goals → Providing the results as a basis for decision-making for future planning (e.g. integration in municipal land use planning)

Legal compliance

Stipulation of measures for local planning to preserve the most important climatic functions of the open spaces → Usually, prohibition of building development to preserve the unsealed, vegetation-covered surface (in some cases, however, development is also possible, for example on areas relevant for the transport of cold air, subject to compliance with certain height limits for buildings)

Strengths/Opportunities

Early involvement in planning processes allows adaptation to climate change to be proactively addressed, as e.g. settlement structures can only be adapted/converted in slow cycles. Often, climate-relevant open spaces (e.g. as cold air production areas) also cover other requirements, such as the need for recreational spaces close to settlements, thus providing multifunctional benefits for the local population.

Weaknesses/Risks

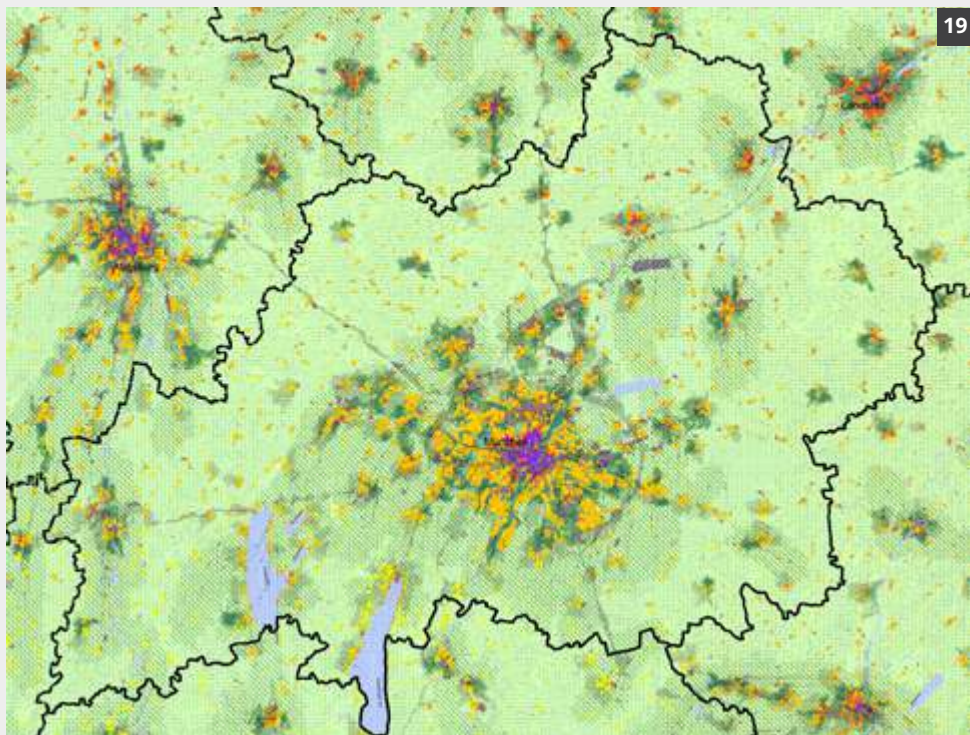
Data collection, analysis and climatic modelling require a great deal of human and financial resources. Due to the specific concerns and available administrative resources, such planning has so far only been carried out in urban regions.

Potential transferability

Modelling is usually carried out according to scientifically verifiable methods and criteria, which are increasingly being harmonised. However, possible interfaces between planning procedures are strongly dependent on the respective planning systems.

Example: Environmental asset mapping “climate & air” in Bavaria (DE)

Climate-change-related heat stress on humans was investigated for the first time for the whole of Bavaria in the environmental asset map “climate & air”. The map illustrates which settlement areas already feature high human bioclimatic exposure and how this exposure will continue to increase under assumptions of weak or strong climate change. In addition, the map shows the location of compensatory areas and cold air outflows important for reducing heat stress. The central product of the state-wide climate analysis is the planning guidance map, which is to be used in the future, especially in regional planning procedures, to evaluate settlement and open space structures.



Source: Bayerisches Landesamt für Umwelt 2022

Planning principle**PLANNING OF SETTLEMENT STRUCTURES****Description**

Keeping areas undeveloped in order to avoid unstructured settlement growth

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal
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Addressed open space functions

Local climate regulation, landscape scenery, ecological connectivity (side effects)

Planning content

Keeping areas/corridors undeveloped in order to prevent the coalescence of neighbouring settlements and the associated negative consequences, such as high infrastructure costs, impairment of the landscape and barrier effects for

ecological connectivity due to ribbon-like urban sprawl

Planning methodology

Definition and specification of specific settlement boundaries/green corridors at strategically important locations between neighbouring settlements, if necessary in coordination with other planning specifications, such as the location of biotope network corridors

Planning process

Analysing the settlement structure and potential “bottlenecks” → Comparison with forecasts and objectives of municipal settlement development → Comparison with open space functions at the relevant locations → Public participation and consultation with authorities → Incorporation in regional/inter-municipal planning documents

Legal compliance

Binding designation of the areas/corridors to be kept undeveloped in superordinate regional/inter-municipal planning documents, these are then taken into account in the municipal designation of building land

Strengths/Opportunities

Settlement boundaries/green corridors provide a clear long-term orientation for future settlement development. Especially in Alpine valley areas, there is a risk of continuous bands of settlement emerging, which can be addressed with this approach.

Weaknesses/Risks

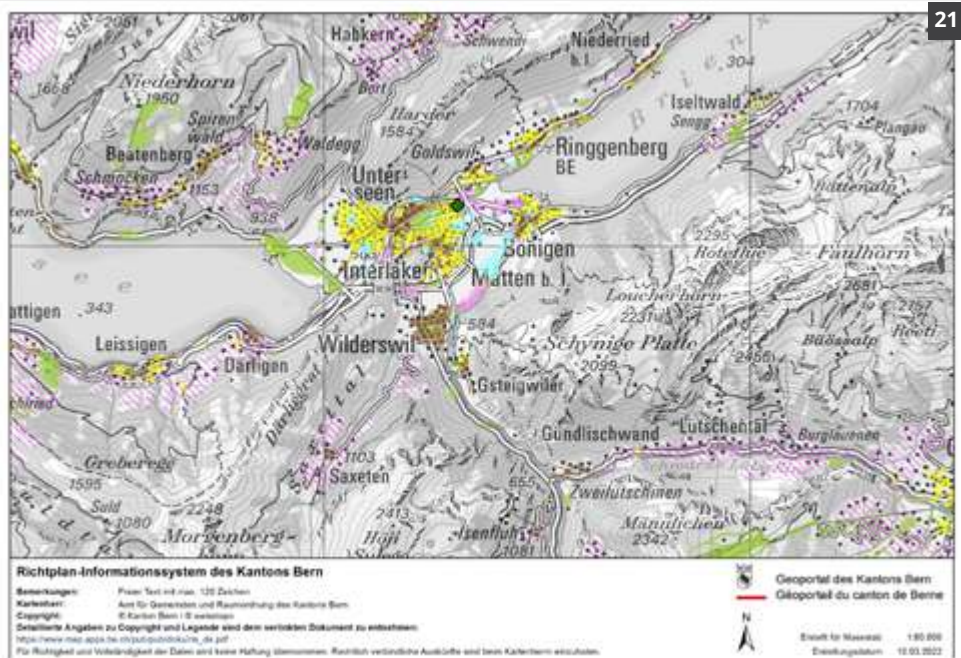
Due to their clear and binding definition, settlement boundaries are sometimes controversial at the municipal level, as they do not address individual building projects but exclude development on principle (except for agricultural buildings in some cases).

Potential transferability

If a corresponding supra-local planning level exists, the linear limitation of settlement development is possible and transferable without great planning effort.

Example: Control of building zones in Switzerland

Switzerland features a multi-level system of spatial planning with planning competencies on the national, cantonal and municipal levels. With the aim of reducing land take and settlement sprawl, federal spatial planning law was revised in a first step in 2014, outlining e.g. new guidelines for the designation of building zones. This includes e.g. a clear obligation to justify (and otherwise reduce) the extent of building zones. As an example, the Cantonal Structure Plan (*kantonaler Richtplan*) of the canton Bern defines criteria for assessing the 15-year building land requirement and for designating building zones, which are determined with the approval of the Structure Plan. They must be considered in municipal land use planning and their implementation is controlled by the cantonal administration



Source: ARE 2022, Kanton Bern 2022

Planning principle

PLANNING FOR THE PRESERVATION OF THE LANDSCAPE

22



Description

Safeguarding landscape features and structures with special significance for regional identity

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Landscape (regional identity) (main effect)

Nature-based tourism, landscape-based recreation (side effects)

Planning content

Identification and safeguarding of outstanding landscapes or landscape components that are to be kept free from encroachment (in particular from technical objects or installations)

Planning methodology

Methodologically, both standardised methods of landscape assessment (e.g. measures of landscape structural diversity at regional level) and subject-related methods (e.g. through citizen participation at local level) are conceivable, whereby the possibilities are increasingly being expanded by new technologies (e.g. 3D visibility analysis in GIS).

Planning process

Integrating landscape scenery as a criterion in planning processes for infrastructure (e.g. for wind turbines) → Choosing a form of assessment → Organising an interactive process for the consultation of citizens and experts → Deriving guidelines for planning processes, e.g. through locational criteria or exclusion areas

Legal compliance

Binding incorporation of criteria/areas for safeguarding the landscape scenery is usually only possible in subordinate planning procedures, e.g. in regional planning for wind power plants

Strengths/Opportunities

The landscape and its visual importance for local/regional identity are often perceived by citizens as the most important criteria in spatial planning. Through appropriate consideration and early participation, problematic areas can be identified at an early stage.

Weaknesses/Risks

Perceptions of landscape beauty and identity can differ greatly in the subjective views of citizens, so there is great potential for conflict in negotiation processes conducted at local or regional level. At the same time, landscape scenery as a criterion is very difficult to objectify.

Potential transferability

A transfer of planning approaches based on transnationally harmonised criteria is difficult to implement. One approach to internationally coordinated landscape protection is the European Landscape Convention (ELC) initiated by the Council of Europe. It has been, however, criticised and has not been signed by all Alpine countries.

Example: Assessing natural/cultural heritage in Regional Landscape Plans in Italy

The Regional Landscape Plans in Italy make detailed analyses of natural and cultural landscapes, and also involve citizens through an extensive participation process. The Landscape Plan of Friuli Venezia Giulia in one of the OpenSpaceAlps pilot sites analysed various levels of cultural sites, classified them and even created a network of cultural sites that can be important for recreational aspects. The plan defines rural and industrial archaeological sites, fortifications, mediaeval villages, spiritual sites, venetian villas, other cultural sites and a network of visual axes, which should be maintained and kept free of development. Furthermore, the region is divided into 12 intermunicipal sub-regions where landscapes that are to be protected are defined according to the following criteria: environmental and ecosystem features, characteristics of the hydro-geomorphological structure, phenomena that have evolved over time and features linked to identity and cultural history.

Introduzione

Criteri di delimitazione

a) I fenomeni di territorializzazione affermati nella storia di cui permangono i segni	● ● ●
b) I caratteri dell'assetto idro-geomorfologico	● ● ○
c) I caratteri ambientali ed ecosistemici	● ● ○
#####) le figure territoriali di aggregazione dei morfotipi	● ● ○
#####) Gli aspetti identitari e storico-culturali	● ● ●
#####) l'articolazione amministrativa del territorio e i relativi aspetti gestionali	● ● ●

Da sempre il termine Carnia ha individuato una unità territoriale ben definita nei suoi limiti spaziali che coincidono anche con una forte identità storico-culturale e una consolidata tradizione amministrativa e gestionale che si rifà alle esperienze dapprima della Comunità della Carnia, diventata poi Comunità montana della Carnia, ed ora Unione Territoriale Intercomunale che include territorialmente tutti i 28 comuni compresi tra le vallate, dette Canali, definite dall'alto corso del Tagliamento, e dai suoi affluenti principali del lumiei, del Degeno- Peserina e del Bût-Chiansò.

la perimetrazione dell'ambito è quella definita dalla consolidata tradizione geografica di inizio secolo scorso e che da sempre ha segnato i limiti geografici di questa subregione.

La diversità dei paesaggi e degli ambienti è data dall'appartenenza dei rilievi e delle valli all'area più propriamente alpina della Catena Carnica di confine, una vera e propria barriera naturale segnata da passi molto elevati che si abbassano solo in quello utilizzato fin dall'antichità di Monte Croce Carnico (1360 m), e a quella invece più interna caratterizzata da rilievi meno elevati e da valli e conche più ampie.

Tantico insediamento è testimoniato da una trama territoriale ben definita e dalla permanenza di siti e capivalli che hanno guidato la progressiva colonizzazione del fondovalle, dei centri a mezzacosta e di quelli più elevati, anche se oggi il fenomeno dello spopolamento e dello svuotamento a valle caratterizza con diversa intensità l'intero ambito, la popolazione si identifica nei

tradi culturali che segnano e definiscono il tipo "carnico" che pur nella varietà di usanze e linguistiche e della produzione della cultura materiale si rifanno alla matrice friulana anche se, va segnalata la presenza di nuclei di popolazione di origine e parlata alto tedesca.

I sistemi territoriali sono riconducibili a quelli tipici della montagna friulana che si articolano in maniera diffusa tra quelli lineari di fondovalle, di conca, di versante ma

pure tra quelli in quota che sviluppano l'originale modello di uso verticale delle risorse silvo-pastorali.

Zugli: Pieve di San Pietro



Source: Regione Autonoma Friuli Venezia Giulia 2020b

Planning principle

PLANNING TO PRESERVE LITTLE DEVELOPED/NEAR-NATURAL AREAS



Description

Safeguarding large-scale areas with a low anthropogenic “footprint” and thus a near-natural landscape character

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

Habitat function (main effect)

Landscape-based recreation, nature-based tourism, landscape scenery (side effects)

Planning content

Keeping large-scale near-natural areas free from intensive development with technical infrastructure, such as roads or mechanised lift systems (e.g. cable cars, ski lifts)

Planning methodology

Identification of relevant areas through criteria such as spatial accessibility (cf. OpenSpaceAlps methodology in Chapter 2.3), noise pollution/quietness (cf. EEA 2016b), light pollution

Planning process

Defining criteria for the delimitation of areas to be safeguarded → GIS analysis and elaboration of zoning proposals → Coordination with sectoral planning (especially nature conservation) → Consulting public authorities and the public → Binding incorporation in (supra-)regional planning documents → Regular evaluation and adjustment if necessary

Legal compliance

In connection with a nature conservation purpose (specific habitats), the focus is on (large-scale) protected areas as sectoral planning instruments. However, (supra-)regional spatial development plans can also have a supplementary effect and ensure large-scale areas remain undeveloped (cf. Zone C of the Bavarian *Alpenplan*).

Strengths/Opportunities

By safeguarding large-scale interconnected open spaces, supra-local spatial planning can contribute to the safeguarding of an interconnected network of open spaces in addition to nature conservation. Besides its importance for the protection of Alpine flora and fauna, this also secures large, very attractive areas for nature-based Alpine tourism, which can be “experienced” without mechanised lift systems.

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Weaknesses/Risks

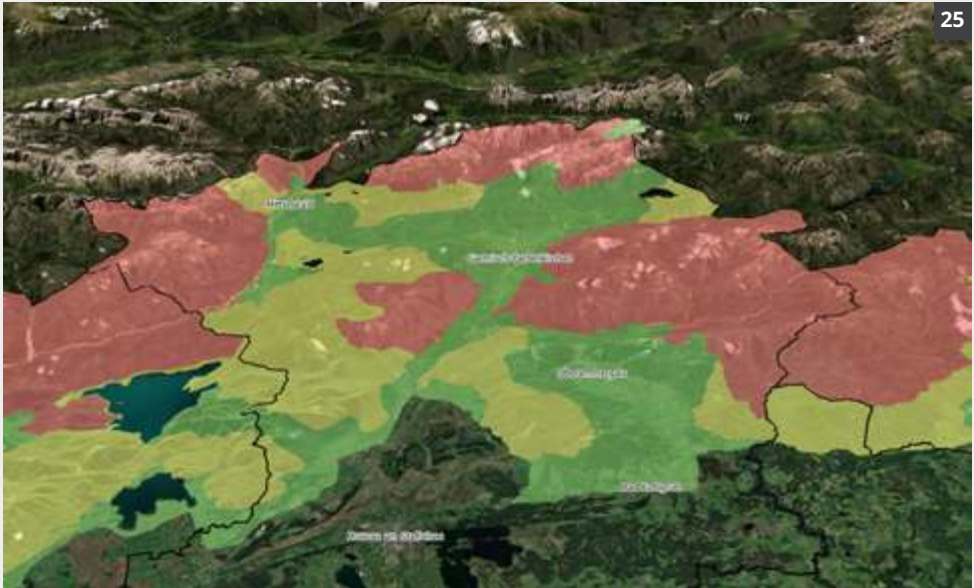
Large-scale open spaces with a low degree of infrastructure development exist for the most part only in high mountain locations and tend to be rather spatially isolated due to a lack of structural ecological connectivity in the valley areas. This necessitates a combination with other planning instruments.

Potential transferability

With the basic work of the OpenSpaceAlps project (Alpine-wide mapping/modelling based on the methodology of Nischik & Pütz 2018), near-natural Alpine open spaces could be safeguarded on the basis of a harmonised method. However, the legal possibilities differ between the planning systems of the Alpine countries.

Example: Bavarian Alpenplan (DE)

The so-called *Alpenplan* was included in the Bavarian State Development Programme (LEP) as early as 1972. It has a strong binding effect on subordinate planning levels and regulates the development of the Bavarian Alps with transport projects such as roads, cable cars or ski lifts in a comprehensive zoning plan (covering around 4,393 km²). In Zone C (“quiet zone”), transport infrastructure is, with a few exceptions, generally not permitted, in Zone A (“development zone”) it is generally allowed. Zone B forms a “buffer zone” in which projects are examined on a case-by-case basis to determine whether they meet the requirements of spatial planning. For 50 years, the Alpine Plan has thus ensured the balanced spatial development of the Bavarian Alps



Map: C. Meyer

Geodata sources: StMWI 2021, Earthstar geographics (basemap)

Planning principle

PLANNING FOR MULTIFUNCTIONAL OPEN SPACES



Description

Development and application of planning approaches to unify different, overlapping open space functions

Relevant planning levels

transnational	national	federal state	regional	inter-municipal	municipal

Addressed open space functions

In line with the planning purpose and spatial scale, the aim is to incorporate diverse open space functions

Planning content

Establishing/safeguarding multifunctional open spaces with diverse ecological, social and economic functions

Planning methodology

Analysis and assessment of the open space functions relevant for planning, in particular using the concept of ecosystem services

Planning process

Relevant in all phases of planning processes

Legal compliance

Legal requirements depending on the associated planning instruments → Multifunctional justifications for area designations generally facilitate binding implementation in planning

Strengths/Opportunities

Deliberate planning for multifunctional open spaces has numerous advantages, including above all an increase in public acceptance of sustainable planning. In addition, it can emphasise the justification for specific stipulations in planning documents and thus increase their legal certainty. Multifunctional open spaces also help reduce land use conflicts.

Weaknesses/Risks

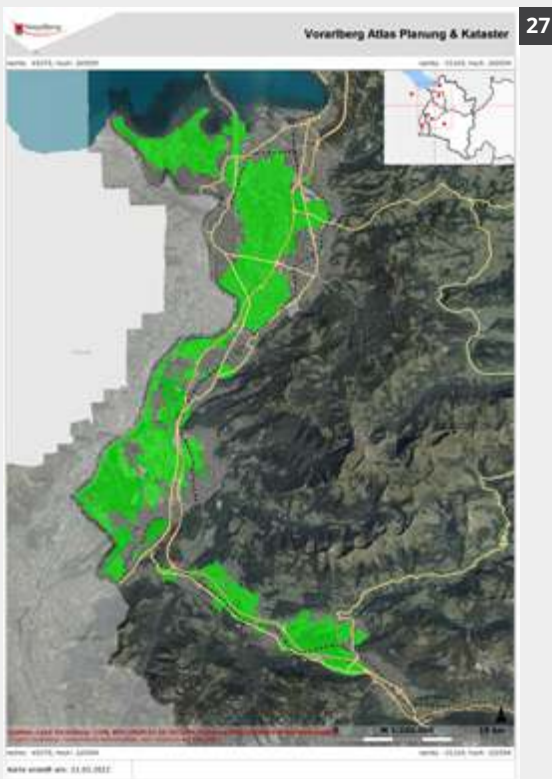
Not all open space functions can be combined, such as intensive agricultural land use (e.g. through intensive monocultures) and ecological connectivity for species that depend on certain near-natural vegetation.

Potential transferability

There are no transnational guidelines or criteria. However, the planning of multifunctional open spaces is in principle suitable for use in a wide variety of contexts and planning systems.

Example: State Green Zone Vorarlberg

The State Green Zone (*Landesgrünzone*), which came into force in 1977, is a binding planning instrument enacted by the Vorarlberg federal state government. In the delimited areas, municipalities are generally not permitted to designate building land. The State Green Zone was established to prevent the large-scale coalescence of settlement areas in the valley floors of the Rhine Valley and Walgau. The areas safeguarded by spatial planning combine various functions. These include the protection of the ecological balance and the landscape, the preservation of local recreation areas and of agricultural areas. The State Green Zone has contributed to securing a coherent network of open spaces in the valley areas and to the densification of the surrounding settlement areas. It is supplemented by a so-called “blue zone” for preventive flood protection.














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Source: Amt der Vorarlberger Landesregierung 2017, Land Vorarlberg 2022 (VoGIS)

The planning principles presented can be divided into **positive and negative planning logics**. Positive planning means that planning decisions are made on the basis of the specific natural characteristics and functions of the open spaces. Examples of this are planning to safeguard agricultural land (on the basis of soil quality), to safeguard climatic compensation areas (on the basis of local/regional climate regulation functions) or to safeguard/restore ecological networks (e.g. on the basis of importance as migration corridors for certain animal species). Negative planning, on the other hand, involves open space planning being carried out by setting exclusion criteria for certain construction or infrastructure measures (e.g. for wind turbines, ski lifts or settlement areas). In general, it can be said that **neither positive nor negative planning approaches are to be preferred across the board**. Rather, it is a matter of finding a **balanced mix** that incorporates both logics. In order to identify **potential trade-offs and synergies** between the planning principles presented, an assessment is also made in the following table.

Tab. 5: **Assessment of synergies and trade-offs between planning principles**

Planning principles	Evaluation Trade-offs ↔ Synergies	Potential trade-offs e.g. with...	Potential synergies e.g. with...
Planning to safeguard agricultural production		Planning to secure/restore ecological connectivity	Planning of settlement structures
Planning for the prevention of natural hazards		Planning for multifunctional open spaces	Planning to safeguard local/regional climatic compensation areas
Planning to secure/restore ecological connectivity		Planning to safeguard agricultural production	Planning to preserve little developed/near-natural areas

Planning principles	Evaluation Trade-offs ↔ Synergies	Potential trade-offs e.g. with...	Potential synergies e.g. with...
Planning for the management of intensive tourism development		Planning to safeguard (local) outdoor recreation	Planning to preserve little developed/near-natural areas
Planning of renewable energy installations		-	Planning for the preservation of the landscape
Planning to safeguard (local) outdoor recreation		Planning for the management of intensive tourism development	Planning for multifunctional open spaces
Planning to safeguard local / regional climatic compensation areas		-	Planning for the prevention of natural hazards
Planning of settlement structures		-	Planning for the preservation of the landscape
Planning for the preservation of the landscape		-	Planning of renewable energy installations
Planning to preserve little developed/near-natural areas		Planning to safeguard (local) outdoor recreation	Planning to secure/restore ecological connectivity
Planning for multifunctional open spaces		-	Planning to safeguard (local) outdoor recreation



4.

INTEGRATED STRATEGIES FOR OPEN SPACE PLANNING

Sustainable spatial development in the Alpine Space requires integrated planning strategies that are adapted to the respective spatial structure and the specific challenges. Therefore, planning strategies for six schematic spatial/landscape types (cf. Chapter 2.2) are discussed below, which can be applied to different examples in the Alpine Space. In order to visualise the many possible manifestations of consistent open space safeguarding, a fictitious visualisation was created at the end of the chapter.

4.1 (High) mountain areas with a low level of fragmentation

Description: Interconnected (high) mountain areas which, due to their topography and extensive human land use (e.g. extensive Alpine pastures and forestry), can largely be classified as near-natural and are only slightly fragmented by technical infrastructure

Examples:



Triglav national park (SLO) [28]



Schladminger Tauern (AT) [29]



Almajur valley (AT) [30]

Challenges: Development pressure due to construction of mechanised lift systems; coordination of spatial planning with protected areas; balance between nature conservation and human use (e.g. individual outdoor recreation)

Often, these areas are already largely protected from building/infrastructure development by nature conservation designations such as national parks, nature reserves or Natura 2000 sites. Here it is more important to coordinate spatial planning and nature conservation in order to close potential gaps in the system of protected areas. State/regional inventories can be developed as an instrument to ensure the comprehensive protection of these less fragmented, near-natural areas. A good example is the “White Zone Inventory”⁴ in the federal state of Vorarlberg (AT), which has so far only received the status of a non-binding spatial planning concept. The Alpine-wide open space analysis of the OpenSpaceAlps project (cf. Chapter 2.3), which was carried out using a similar methodology, can serve as a starting point for the development of regional inventories.

Alongside sectoral nature conservation, spatial planning also bears responsibility for the preservation of large-scale Alpine open spaces, as underlined by Art. 9 (4) lit. a of the Implementation Protocol “Spatial Planning and Sustainable Development”⁵ of the Alpine Convention. This article requires spatial

⁴ www.vorarlberg.at/weisszonen (04.04.2022)

⁵ The designation of quiet zones is also mentioned in other implementation protocols of the Alpine Convention (e.g. Nature protection and landscape conservation, tourism, energy) (cf. Job et al. 2017)

planning plans and programmes to designate “tranquil areas and areas in which construction of buildings and infrastructure is restrained or prohibited, as are other damaging activities”. In contrast to nature conservation, which refers to the specific habitats of certain animal and plant species/associations, a broader approach can be pursued through the designation of quiet/tranquil areas by spatial planning. This also has other purposes such as providing nature-based recreation and deliberately forms a counterbalance to areas with intensive technical tourism development.

In very peripheral regions of the Alpine Space, however, it can be assumed that there are challenges other than development pressure. Especially in regions characterised by out-migration of the local population and the abandonment of mountain farming, a different transformation of the landscape is more likely to be observed, accompanied by scrub encroachment/reforestation of areas formerly kept open by Alpine pastures as well as the abandonment of smaller settlements. Here, integrated spatial and landscape planning can also play a coordinating role in managing structural change in order to achieve a sustainable increase in the attractiveness of the affected areas, both for locals and tourists.

4.2 Technically/touristically modified (high) mountain areas

Description: (High) mountain areas that show strong anthropogenic modification of the landscape, for example through technical recreational facilities (e.g. ski slopes and lifts) or other intensive forms of development

Examples:*Sölden (AT) [31]**Val Thorens (FR) [32]**Andermatt (CH) [33]*

Challenges: Land use pressure due to expansion of existing facilities/ski slopes; intensification of the use of Alpine pasture or forestry (e.g. expansion of the forest road network); increasing probability of Alpine natural hazards

The comparatively intensive use of these areas can be observed, for example, through modification of the natural terrain and the natural water balance in skiing areas or a dissection of forests by wide forest roads/trails. In the course of advancing climate change, which is associated with an increased probability of extreme precipitation events, areas with impaired natural soil and protective forest functions are particularly vulnerable to natural hazards such as landslides or debris flows. Thus, consideration of climatic changes should become an integral part of long-term planning, and risk assessments should also be conducted for existing infrastructure. One challenge lies in the fact that in some states the relevant infrastructure is only subject to sectoral law

(e.g. cableway law, forestry law) and thus is outside of the regulatory scope of spatial planning. In the medium term, intersectoral spatial planning should therefore assume a stronger coordinating function, as it is best suited to coordinate the various requirements (tourism, forestry, natural hazards, nature conservation, etc.) due to its interdisciplinary character.

Especially for the development of ski areas, it can be observed that although only a few new landscape areas are being developed for ski tourism, the expansion of existing ski areas continues to be a major issue in many regions. In order to become less dependent on individual decisions and very controversial local negotiation processes, state/regional spatial planning plans/programmes should set clearly defined development boundaries for ski areas at strategically important locations. They may also include potential expansions of development. This approach offers long-term planning and decision-making certainty to all stakeholders involved.

For infrastructurally “consolidated” areas, it is also conceivable to concentrate the generation of renewable energy on a small or middle scale (e.g. wind turbines currently under development that are specially adapted to mountain environments). This would help to preserve the open nature of other, infrastructurally less developed areas. In addition, existing tourist facilities usually have connections to the electricity grid, which could be used or upgraded to feed in the generated energy.

4.3 Valley areas with a low level of fragmentation

Description: Valley areas in the permanent settlement space that feature a low proportion of settlement areas and a low level of landscape fragmentation

Examples:*Maria Gern (DE) [34]**Planica valley (SLO) [35]**Kaiser valley (AT) [36]*

Challenges: Increase in tourism use; increasing abandonment of agricultural use; increasing likelihood of Alpine natural hazards

Those open spaces, which feature only a small share of settlement and infrastructure despite their location in the permanent settlement space, are of great importance, especially as they represent important connectivity corridors (e.g. for wildlife). In many Alpine valleys, settlement development tends to form ribbon-like settlement structures despite low population density. Therefore, even with comparatively low land use pressure, corresponding corridors in the valley areas must be safeguarded by spatial planning. Necessary technical infrastructure such as roads and power lines must also be designed in such a way that the connectivity function of the valleys is maintained.

Where there is still sufficient open space in the valley areas, land use conflicts concerning renewable energy production will also increase in the future. This is especially relevant for the construction of large-scale “parks” of photovoltaic (PV) power plants. Even if the large-scale expansion of these plants has great potential to enhance the economic development of peripheral regions, forward-looking spatial planning is required to coordinate the construction of PV plants with the requirements of agriculture, for example. New possibilities for combining agricultural use and photovoltaic use (“Agri-PV”) should be considered at an early stage.

Historically, valley areas that are particularly vulnerable to natural hazards such as flooding have often remained free of settlements. Since the probability of extreme climatic events is increasing in the course of climate change, in the future it will be necessary to designate even larger hazard zones, e.g. around Alpine rivers, which include a ban on building activity in order to prevent flooding damage to people and buildings.

4.4 Highly fragmented valley areas

Description: Valley areas in the permanent settlement areas (especially main valleys), which feature a high proportion of settlement, industrial and commercial areas due to their central location and are thus strongly fragmented by technical infrastructure

Examples:*Merano, Adige valley (IT) [37]**Grenoble, Isère valley (FR) [38]**Salzburg, Salzach Valley (AT) [39]*

Challenges: Increasing barrier effects for ecological connectivity; impairment of the quality of life due to noise and pollutant emissions as well as shortage of recreational areas close to settlements; urban sprawl and impairment of landscape scenery

The central valleys of the Alpine region are characterised by a high degree of urban sprawl and landscape fragmentation, due to the clustering of road and rail infrastructures and large-scale settlement areas. For these densely populated valley areas, it is important in use supra-local planning documents to safeguard the last remaining green corridors that cross the valley in order not to exacerbate the ecological barrier effect. The settlement structure thus pursued also contributes to safeguarding the aesthetic qualities of the cultural landscape and the remaining agricultural areas. Strategically designed

open space protection in these densely populated valley areas is also required for recreational areas close to settlements. Such areas are often impaired by noise and pollutant emissions. In addition to preventing development on areas in the valley that are particularly suitable for local recreation, strategic spatial planning should develop such areas as multifunctional open spaces. This allows several open space functions, such as local outdoor recreation, natural hazard prevention (e.g. rainwater retention and flood retention) and climate adaptation (e.g. cold air production and transport), to be combined through upgrading the quality of such areas.

The above-mentioned objectives are not easy to realise, as in many places a constantly high demand for housing is driving the demand for new building land in densely populated areas. Therefore, it is also important to intensify the pursuit of (planning) instruments of inner development and urban densification. Suitable measures include the conversion of urban brownfields, the increase of building density in suburban areas and the consistent use of vacant lots (“in-fill development”). Depending on the country or region, there are various legal, financial and political obstacles to these approaches. A sophisticated mix of regulatory, monetary and persuasive instruments is thus required by urban development planning to promote inner development and reduce land consumption⁶.

Special category: transit axis

Valley areas with distinctive transit functions for European passenger and freight transport comprise a particularly relevant spatial category. These transit axes are often characterised by clusters of wide road and rail infrastructures, including motorways and long-distance railway lines. This applies especially to important transalpine connections such as the *Brenner* (IT, AT, DE), *Tauern* (SLO, AT, DE) and *Gotthard* (IT, CH) axes. The fragmentation effect of these transit axes for ecological connectivity in the Alpine region is enormous. Routing through tunnels is limited by the natural and financial framework conditions

⁶ Cf. European Environment Agency: “Land recycling and densification” (<https://www.eea.europa.eu/data-and-maps/indicators/land-recycling-and-densification/assessment-1>)

and is therefore seldom an alternative for the creation of ecological corridors. Therefore, it is even more important to identify strategically important locations for the connectivity of otherwise fragmented habitats and to build green bridges (wildlife crossings) there (ARL 2022). The financial needs of these measures are likely to be considerable and should be addressed through national and/or European funding support, which would make an important contribution to the implementation of the EU Biodiversity Strategy 2030.

4.5 Pre-Alpine agglomeration areas

Description: Pre-Alpine areas in the vicinity of agglomeration areas

Examples:



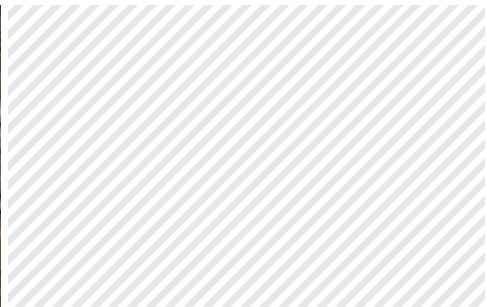
Munich (DE) [40]



Zurich (CH) [41]



Ljubljana (SLO) [42]



Challenges: Settlement pressure due to the expansion of dynamic urban agglomerations; increasing traffic congestion and landscape fragmentation; loss of local recreational areas

In the vicinity of the Alpine Convention perimeter there are several urban agglomeration areas (e.g. Munich, Milan, Ljubljana, Lyon, Marseille, Vienna, etc.) with a great influence on the spatial development of the Alpine Space. The interactions between inner-Alpine areas and the pre-Alpine agglomeration areas represent a challenge for spatial development strategies in the EUSALP macro-region. The relevant strategies are very similar to those mentioned in Chapter 4.4. For example, the development of these (urban) regions has a significant influence on the use of "green infrastructure". This is because an insufficient supply of green/recreational spaces close to cities means that the inhabitants of the agglomerations additionally frequent the inner-Alpine areas for recreational purposes. Since this excursion traffic is associated with large volumes of traffic, the expansion of sustainable public mobility is also important in order to reduce the pressure of motorised individual transport.

With regard to settlement development in the pre-Alpine agglomeration areas, the remaining open space corridors are to be kept free as a matter of priority in order to prevent negative local climatic consequences and to secure corresponding local recreation areas. This should be ensured by inter-communal/regional planning specifications that include all municipalities of the respective functional agglomeration area. Possible instruments in the supra-local planning documents for this are regional green corridors and/or settlement boundaries. For an in-depth assessment, please refer to the results of the Interreg Alpine Space project "Los_Dama!", which has dealt with the specific topic of planning and developing green infrastructure in Alpine metropolitan areas.

4.6 Transitional spaces

Description: Spaces at the transition between different altitude zones or between areas of different intensity of human land use

Examples:



Bernese Oberland (CH) [43]



Passeier valley (IT) [44]



Mali Rakitovec (SLO) [45]



Challenges: Intensification of individualised recreational use; changes in the natural landscape in the course of climate change and increasing probability of Alpine natural hazards

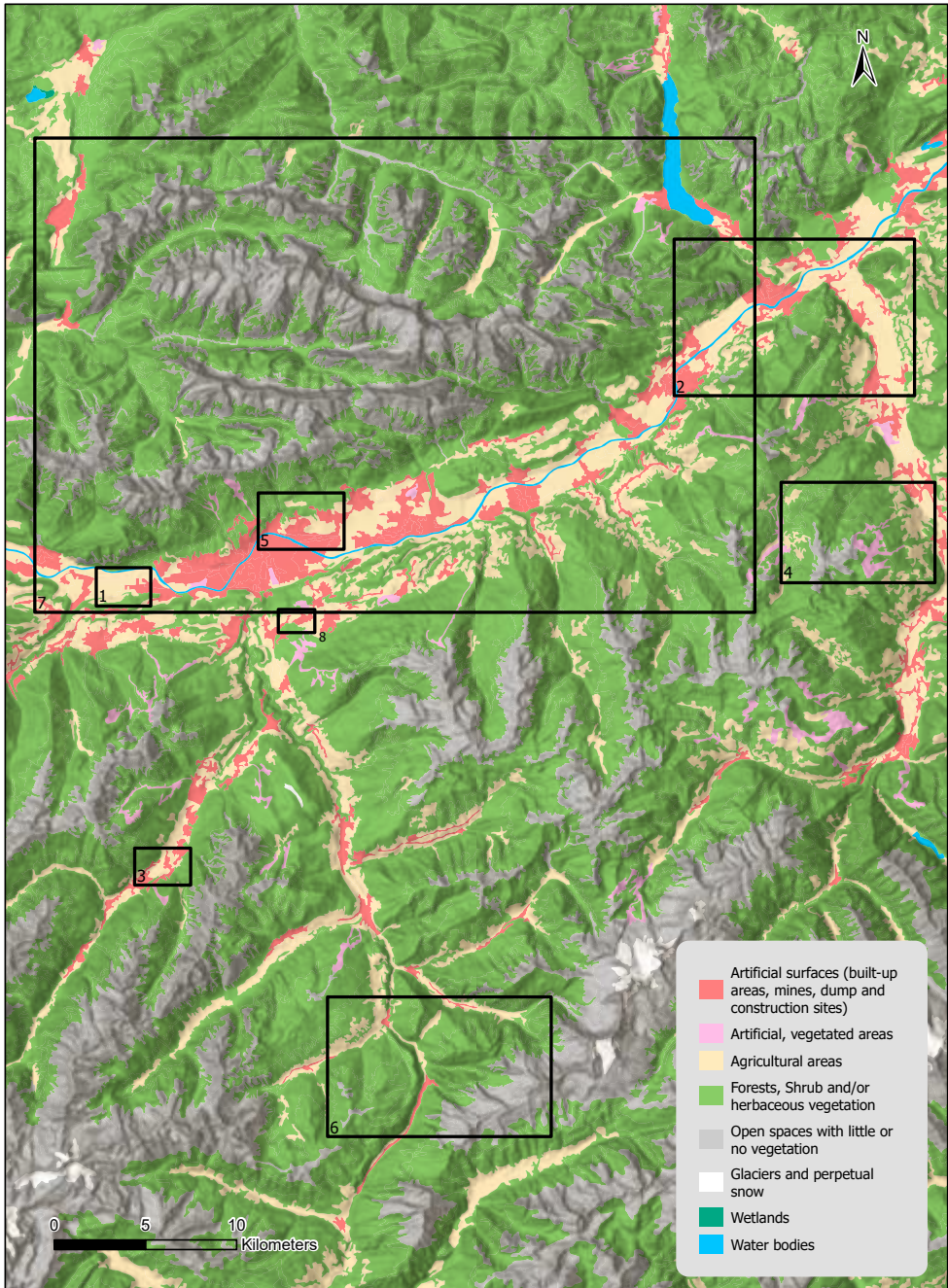
In addition to the schematic categorisation of spatial/landscape types used here, spaces at the transition between different altitude levels or different intensity levels of human land use must also be addressed. In particular,

boundaries influenced by the natural environment, such as the tree line or the boundary of permanent settlement, are increasingly shifting due to the rapidly occurring climate changes. At the same time, these transitional areas are particularly threatened by increasingly frequent and intensive natural hazards, hindering the expansion of settlement areas on steeper slopes.

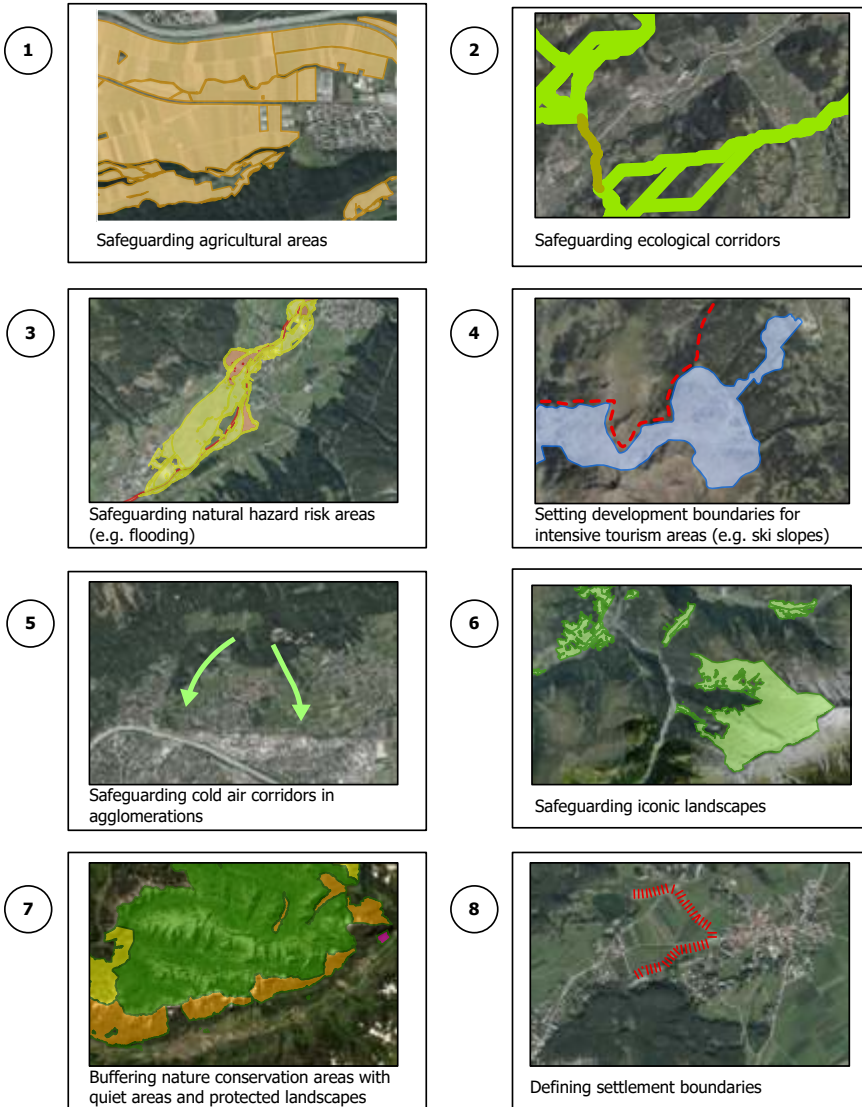
Transition areas between strict nature conservation areas and surrounding open spaces are particularly relevant for spatial planning. Coordinated spatial management is necessary to ensure that protected areas are not isolated in their function and to support a comprehensive network of green infrastructure (GI). Planning documents should therefore provide for both the buffer and corridor functions of open spaces near protected areas. This can be implemented, for example, through inter-municipal planning and coordination between the municipalities concerned, which can also coordinate other issues, such as inter-municipal tourism visitor management.

Due to the increasing individualisation of landscape-based recreational use (e.g. due to new technology enabling the use of e-mountain bikes in steep terrain), new challenges for spatial and landscape planning arise. However, this is usually not covered by the regulatory framework of “classic” spatial planning in most Alpine countries, which can mainly control building allocation but not individual recreational activities. Instead, other integrated approaches to visitor management are needed, especially in protected areas. Such approaches should increasingly include digital information and awareness-raising services for nature-friendly recreational use.

4.7 Schematic visualisation: Consistent safeguarding of open spaces




Schematic visualization: Consistent safeguarding of open spaces



Please note: This schematic figure (made of existing and fictious elements) was only made for visualization purposes and does **not** imply any real planning recommendations!

Data/map sources: Land Tirol - data.gv.at, Environment Agency Austria - lebensraumvernetzung.at, Earthstar Geographics, Maxar, Microsoft, Esri/Geoland/Intermap/NASA/NGA/USGS, European Environment Agency - Copernicus Land Monitoring Service (Corine Land Cover, manually reclassified)



**5.
FRAMEWORK
CONDITIONS
FOR SUCCESSFUL
PLANNING
INTERVENTIONS**

The planning principles and strategies described above can only be successfully applied if appropriate framework conditions exist. Some such strategies are in the hands of the respective planning authorities, but others can only be influenced by higher government levels, for example with regard to legislation and the provision of financial resources. The creation or improvement of these framework conditions requires a broad perspective on the sustainable development of open spaces, one that includes diverse stakeholders and fields of action.

5.1 More than planning – implementing spatial governance

The safeguarding and sustainable development of open spaces and their relevant functions is a field of action that is primarily shaped by regulatory planning instruments. However, such instruments alone have only a limited impact and should be used as one **component of manifold spatial “governance”**⁷. In addition to the regulatory dimension of spatial planning through regulative planning instruments, **complementary governance mechanisms** are important. These include, in particular, **financial/monetary and communication-oriented approaches**. Therefore, regulatory planning interventions for open spaces can be complemented, for example, by the following measures:

- **Financial support programmes for the creation of sustainable settlement and open space structures:** e.g. support for inner development/densification measures, extensive agricultural use or measures for the (re-)creation of ecological connectivity (e.g. through wildlife bridges on motorways)
- **Tax incentives to reduce land take:** e.g. through tax compensation for

⁷ The term governance can be used in very different ways in the context of spatial planning, from a simple definition of spatial governance as “the political process through which the state (usually through local governments) allocates spatial development rights” (Berisha et al. 2021: 181) to more complex debates with different implications for planning (see e.g. Nuissl & Heinrichs 2011).

municipalities with high proportions of land covered by planning restrictions (depending on the respective municipal tax system)

- **Awareness-raising campaigns for land-saving settlement development and the consideration of ecosystem services:** especially directed at local decision-makers and the public
- **Cooperative strategy development for regional open space concepts:** broad regional participation process for the elaboration of regionally adapted open space concepts and for increasing the acceptance of regional planning
- **Collection and dissemination of good examples with a role model function:** preparation of case studies (e.g. for local or regional planning and implementation processes) and dissemination as “good practices”, which can serve as inspiration or orientation for other planning agents
- **Provision of guidelines and handouts:** concrete methodological and legal aids for regional and municipal planning agents concerning the implementation of specific planning goals

In order to assess planning strategies in the long term, it is also important to conduct appropriate **spatial monitoring of settlement and open space development**. This can be integrated into existing monitoring systems and spatial data infrastructures. Area-wide monitoring approaches for large areas can be created based on continuously updated public geodata⁸. However, if a more precise ecological assessment is required, on-site surveys (e.g. biotope mapping) must usually be carried out at regular intervals and fed into the monitoring system. Planning documents can be properly evaluated on the basis of monitoring systems. In general, continuous monitoring should cover the following dimensions:

- **Quantitative dimension:** e.g. development of the proportion of land occupied by settlement areas and open spaces, development of land take/ loss of open space per inhabitant

⁸ A good example of a comprehensive land monitoring system based on geodata is the "Monitor of Settlement and Open Space Development (IOER Monitor)" operated for Germany by the Leibniz Institute for Ecological Urban and Regional Development: <https://www.ioer-monitor.de/en/>

- **Structural dimension:** development of structural features such as urban sprawl, landscape fragmentation or structural connectivity of open spaces
- **Qualitative dimension:** development of qualitative characteristics, especially ecosystem services as well as functional ecological connectivity

5.2 Expanding capacities and resources

In order to meet the diverse challenges and to better integrate open space functions into future planning decisions, the responsible authorities need **sufficient financial and personnel resources**. Especially for regional and inter-municipal spatial planning, additional qualified staff are needed in many places to deal with the conception and implementation of integrated planning. This is because planning instruments can only be enhanced with additional financial resources beyond those for “day-to-day business”. In addition, **providing funding for pilot projects** can also contribute to testing new planning approaches and further developing Alpine planning systems.

In addition to the question of available staff, it is equally important to address the **education and training of spatial planners**. The consideration of open space functions and ecosystem services should therefore be strengthened both in university planning courses and in regular training courses for spatial and landscape planners. Young planners are particularly open-minded to the topic of open space planning and can contribute innovative ideas, as the OpenSpaceAlps “capacity building seminar for young professionals” has shown.

In general, it is clear that spatial planners are not able to bring together all the information relevant to open space planning, despite the training they receive. This applies, for example, to complex issues in landscape ecology that are important for safeguarding/restoring functional ecological connectivity. Scientists and specialist authorities are therefore required to provide relevant specialist information suitable for spatial planning. This specialised information should be compiled so as to explain the most important aspects of the planning objective in an easily understandable fashion that is particularly suitable

for the process of “weighing” and balancing the different concerns/interests⁹ in spatial planning.

5.3 Promoting transnational exchange and coordination

The OpenSpaceAlps project has identified multiple potentials for spatial planning in the Alpine Space to benefit from a transnational exchange of experiences and the resulting learning processes. For this purpose, **comparable challenges for open spaces** were identified in the OpenSpaceAlps pilot regions and the **transfer of potentially suitable spatial planning instruments (or selected components of these instruments)** was discussed in stakeholder workshops. Laner et al. (2021) emphasise that especially “positive” planning approaches, which refer to concrete open space functions to be safeguarded (e.g. designation of agricultural priority areas), and integrative/multifunctional planning approaches (e.g. multifunctional green zones/corridors) are suitable for policy transfer, in contrast to “negative” planning approaches (e.g. the designation of settlement boundaries or zoning of second homes). The following **framework conditions** have been elaborated as a **basis for the transnational transferability of open space planning approaches** (Laner et al. 2021):

- Existing or emerging land use pressure on open spaces
- Suitable regional databases on the qualities of open spaces
- Awareness of open space functions and ecosystem services among spatial planners and the wider public
- A culture supportive of regional planning and inter-municipal cooperation
- Legal implementation possibilities

⁹ Cf. ARL-International Glossary “Weighing of interests”: <https://www.arl-international.com/knowledge/glossary> (09.03.2022)

A set of **transnationally harmonised priority criteria** at different planning levels can be used in the further development of planning tools (Laner et al. 2022). These are described and discussed in detail in OpenSpaceAlps Deliverable D.T2.5.1 “Priority criteria list for the preservation and safeguarding of open spaces in the EUSALP area”. Examples of such priority criteria include indices for determining the quality of land for agricultural use, ecological (biotope) connectivity or landscape-based recreation.

In addition to the well-known requirements of the Alpine Convention, the **need for the stronger cross-border coordination of spatial planning in the Alpine region** is also emphasised by current calls, most recently in the position paper “Safeguarding open spaces in the Alpine Region” (ARL 2022) of the *AlpPlan* Alpine spatial planning network. From the perspective of the OpenSpaceAlps project, three components are essential to institutionalise **standards for cross-border cooperation in spatial planning in the Alpine Space** (ALPARC 2021b):

- **Exchange of planning documents:** systematically organised, regular exchange of planning documents/instruments between the regions of the Alpine Space in order to create better cross-border understanding of existing instruments and procedures
- **Consultation in planning procedures in border regions:** mandatory cross-border consultation procedures for significant plans and projects along national or regional border areas (e.g. within a buffer zone of 20 km on each side of the border)
- **International cooperation framework for spatial planning:** increasing institutionalisation of cooperation/coordination (e.g. in the framework of an international agreement between the Alpine states) on the basis of a common Alpine-wide strategy for (open) space development, in close coordination with the bodies and activities of the Alpine Convention and EUSALP



Since 2020, the OpenSpaceAlps project has been working with the Academy for Territorial Development in the Leibniz Association (ARL) to jointly establish an Alpine-wide spatial planning network. The ARL, a competence centre for spatial planning and development, brings together experts from science and planning practice and acts as an interface for the new AlpPlan network.

It is aimed at experts, planners and decision-makers at all administrative levels as well as suitable private actors. The aim of the network is to facilitate the transnational exchange of experience on concrete planning practices and instruments and thus to contribute to the enhancement of spatial planning in the Alpine region.

More information is available from: www.arl-international.com/activities/alp-plan-network



6.

CONCLUSION

For the sustainable spatial development of the Alpine region, it is necessary to **invert the perspective of spatial planning towards a stronger consideration of open spaces** (ARL 2022). Without diminishing the needs of the built environment, resulting from requirements for living, working and transport, it is equally necessary to assess where open spaces should be kept free of building development in the long term, based on their specific functions and services. The aim of the OpenSpaceAlps project and of this handbook is to encourage and promote a **more consistent approach to safeguarding open spaces throughout the Alpine region**. According to the OpenSpaceAlps slogan “Open Spaces for Generations to Come”, planning for open spaces is an **essential prerequisite for the resilient and sustainable development of the Alpine Space**, addressing important trends and developments such as climate change and the biodiversity crisis.

At the same time, spatial planning is a complex task that involves a variety of public and private interests as well as different spatial scales. For successful implementation, it will be of great importance to involve the public as well as all relevant stakeholder groups and to develop **common strategic guidelines for the spatial development of states, regions and municipalities**. In doing so, it is important to work out exactly how local people benefit from the preservation of open spaces through specific ecosystem services. At the same time, it is crucial to create appropriate **political, legal and financial framework conditions** at higher levels that support these processes. Therefore, the OpenSpaceAlps project has developed and published a series of *strategic recommendations*.

The OpenSpaceAlps project has shown that there is great potential in transnational exchange on spatial planning and development, as **all states and regions can benefit from mutual learning**. The existing cooperation processes on the cross-border coordination of spatial planning in the Alpine region, which largely originate from the activities of the Alpine Convention and EUSALP, should be further promoted and strengthened. The OpenSpaceAlps project and this handbook are only the **first step in a long-term process** to promote consistent spatial planning for the entire Alpine region. We encourage all relevant stakeholders to use this as a **starting point for regionally and locally concretised strategies for open spaces**.

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GLOSSARY

Ecological connectivity

Ecological connectivity is the unimpeded movement of species and the flow of natural processes that sustain life on Earth.

(<https://www.cms.int/en/topics/ecological-connectivity>)

Ecosystem services

Throughout the past decade, the topic of ecosystem services (ES) has become extremely popular in research, resulting in a huge variety of definitions and terms. For example, ES are defined as benefits people obtain from ecosystems (MEA, 2005), or the direct and indirect contributions of ecosystems to human well-being (TEEB 2010), among other definitions.

(<https://www.alpine-space.org/projects/alpes/en/about/about/ecosystem-services>)

Land take

The land take indicator addresses the change in the area of agricultural, forest and other semi-natural land taken for urban and other artificial land development. Land take includes areas sealed by construction and urban infrastructure, as well as urban green areas, and sport and leisure facilities.

(<https://www.eea.europa.eu/data-andmaps/indicators/land-take-3>)

Landscape fragmentation

Landscape fragmentation is the breaking up of larger areas of natural land cover into smaller, more isolated patches, independent of a change in the total area of natural land cover.

(Mitchell et al. 2015)

Open space

The open space concept refers to areas, which are kept permanently free from buildings, technical infrastructure and soil sealing. This approach focuses on open spaces outside continuous settlements (excluding inner-urban green spaces in the scope of this handbook) in order to highlight the importance of

open spaces on a landscape level. The open space concept focuses on investigating the extent and structure of unbuilt spaces and safeguarding them from (further) urbanisation and fragmentation. It is closely related to the concept of green/blue infrastructure.

(ARL 2022; Job et al. 2020)

Open space planning

Open space planning is not an isolated subject but is rather considered an integrated part of comprehensive spatial planning by integrating the qualities and functions of open spaces in spatial planning procedures and decisions.

(ARL 2022)

Safeguarding open spaces

Preventing open spaces from being developed in a way that impairs or excludes their (natural) functions, mainly through intensive interventions, such as the construction of buildings and soil sealing. This is done by authoritative public action, e.g. through spatial or sectoral planning.

Settlement sprawl/urban sprawl

Urban sprawl is a phenomenon that can be visually perceived in the landscape. A landscape is affected by urban sprawl if it is permeated by urban development or solitary buildings and when land uptake per inhabitant or job is high. The more area built over in a given landscape (amount of built-up area) and the more dispersed this built-up area in the landscape (spatial configuration), and the higher the uptake of built-up area per inhabitant or job (lower utilisation intensity in the built-up area), the higher the degree of urban sprawl.

(Jeager & Schwick 2014, EEA 2016c)

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OpenSpaceAlps Planning Handbook

Perspectives for consistent safeguarding of open spaces in the Alpine region

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