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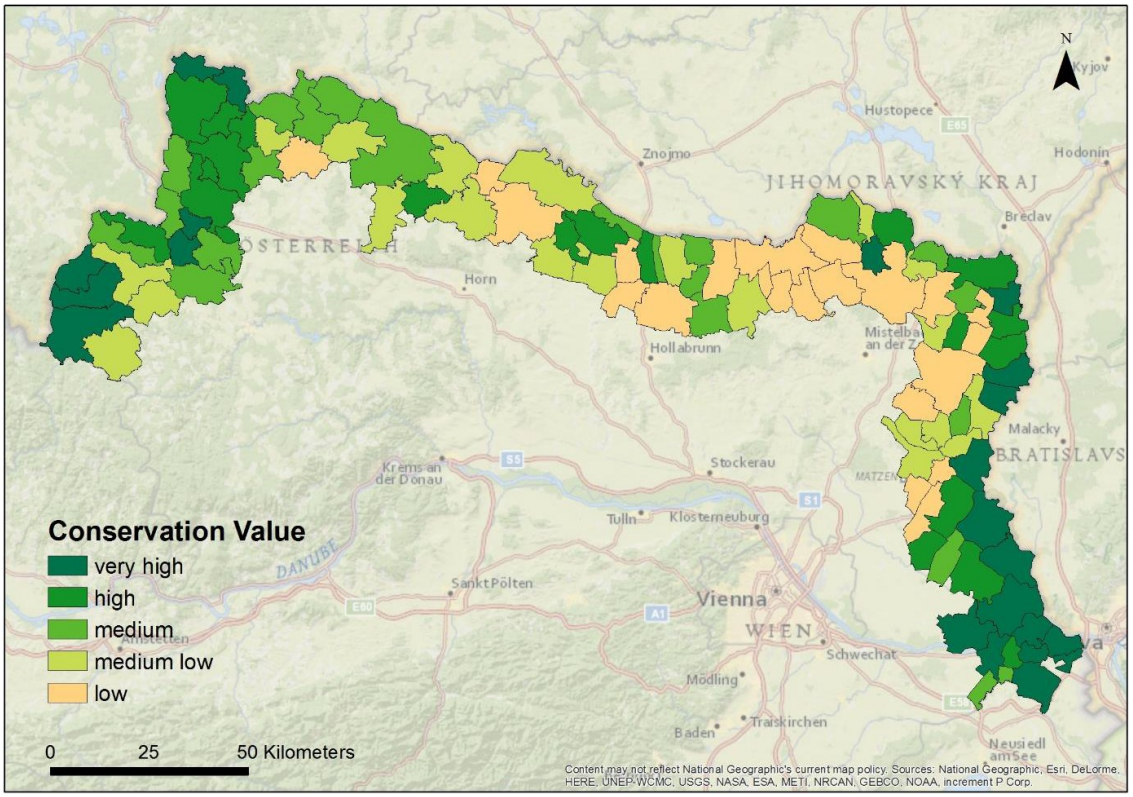
Guiding Concepts for Conservation of the Lower Austrian Green Belt

Das Europäische Grüne Band erstreckt sich entlang des ehemaligen Eisernen Vorhangs durch ganz Europa und verbindet dabei ausgedehnte, naturnahe Biotopflächen und wertvolle Kulturlandschaften mit wachsenden Siedlungsräumen und intensiv genutzten Agrarlandschaften. Diese Studie beschäftigt sich mit dem momentanen Status Quo der Initiative Grünes Band Österreich, sie gibt Einblick in den Wert der Landschaften dieser Region für den Naturschutz und bietet konkrete Vorschläge für die zukünftige Entwicklung der Initiative Grünes Band Österreich und der Niederösterreichischen Grenzgebiete.

Eva Schweiger



Guiding Concepts for Conservation of the Lower Austrian Green Belt

Eva Schweiger, 2015

Abstract

Stretching across Europe along the former Iron Curtain, the European Green Belt connects large undisturbed natural biotopes and valuable cultural landscapes with developing urban areas and intensively used agricultural landscapes. The European Green Belt initiative's main goal is to preserve and restore a pan-European ecological network with a connecting function for species and habitats as well as for conservation work. This study investigates the current status quo of the Austrian Green Belt initiative in regard of organisational structures and conservation activities. Furthermore, a spatial analysis of one specific part of the Austrian borderlands, the Lower Austrian Green Belt, sheds light on the value of this region's landscapes for nature conservation and clearly shows that the Iron Curtain's preserving effect is still present in proximity to the border. The conserved valuable cultural landscapes and (semi-) natural biotope areas can and should contribute to the Lower Austrian Green Belt's integrity and the functioning of the ecological network. The Green Belt's conservation and ecological development crucially depend on guiding concepts coordinated across borders as well as across sectors and administrational levels. This study compiles components of such concepts on municipal level for the Lower Austrian borderlands, suggesting that adapted approaches be used for different landscapes in order to make optimal use of current preconditions for conservation. Conservationists and members of the Green Belt initiative will find concrete suggestions for future development of the Austrian Green Belt initiative and of the Lower Austrian borderlands in this study.

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1 Introduction

In 1989, the idea of a Green Belt along the former Iron Curtain, which had separated Eastern and Western Europe for decades during the Cold War, was born (Geidezis et al. 2014a). Many conservationists had already been aware of the borderlands' great importance and special value before the lifting of the Iron Curtain. In Germany, for instance, the border strip had been subject to ornithological studies years before the border was finally removed (Geidezis et al. 2014a). Undisturbed river landscapes, old-growth forests and traditional, highly diverse cultural landscapes can be found in these regions all over Europe. Up to the present many studies have shown that a multitude of endangered plant and animal species encounter suitable conditions there (e.g. Geidezis et al. 2014b, Schlumprecht & Laube 2012) while their populations are decreasing elsewhere. Why?

When the Cold War ended in 1989 people had been kept out of the borderlands for decades. By reducing human disturbance the Iron Curtain had given rise to a "lifeline" of near-natural landscapes preserved or created by isolation. This "ecological backbone" of the European continent provides habitats to species that have become rare in the surrounding landscapes (Geidezis & Kreutz 2012). Also, it functions as the spine of a network of ecological corridors crossing or running along the Green Belt, many of which are migration paths for big mammals like the European wildcat, wolf, lynx or elk and migratory birds (Hokkanen 2009, Limberger 2009, Neumann 2009, Übl 2009). To all these species the network of biotopes is of great, partly even vital value.

Since the Iron Curtain was lifted the Green Belt initiative's main goal has been to protect this network's integrity against fragmentation. Intensification of agriculture and forestry, sealing, land consumption and urban sprawl are processes we observe all over Europe. They appear, however, in an especially drastic way in the formerly marginalized and economically underdeveloped borderlands. Ever-increasing in speed and extent, they endanger and reduce the amount of remaining valuable habitats for animal and plant species, thus decreasing biodiversity, and reduce the quality of our own lives (Miller 2005, Di Giulio et al. 2009).

Related to this, many border regions have experienced rapid socioeconomic changes in the last decades. Increased transnational traffic started to contribute to an accelerated regional development, helping some regions to make the hoped-for economic leap forward. Others

suffer from demographic changes and rural depopulation, which put pressure on regional economy and politics. In any case, these changes affect land use and landscape structure, provide different preconditions for nature conservation and call for carefully thought-out approaches.

The Austrian Green Belt initiative was formed simultaneously with many other national initiatives within the framework of the newly established pan-European Green Belt. Limited to the former inner-German borderlands during the first years, the idea of a cross-continental Green Belt was taken across Europe in 2003 and brought together a multitude of local and regional initiatives that had already formed in many regions (Geidezis & Kreutz 2012).

Research questions

Since then, much has been achieved for the Austrian Green Belt. The initiative's members have worked assiduously to promote the Austrian Green Belt's protection, trans-national projects have been carried out and local initiatives have been started (Csarmann & Michalek 2013, Gepp 2013, Naturschutzbund Niederösterreich 2013, Naturschutzbund Oberösterreich 2013, Reiter & Krainer 2013). But still – the European Green Belt idea remains largely unknown to the Austrian public, political interest is low and the fragmentation of the biotope network has not been stopped. Why? What impedes effective protection of the Austrian borderlands? Why is the Austrian Green Belt initiative still struggling to arouse public and political interest in the idea? And most importantly – how exactly can we improve the situation?

This study was, in the first place, conducted to find answers to these questions. A number of people involved in the Austrian Green Belt initiative for many years were interviewed. Their experiences, opinions, suggestions and concerns contributed to a comprehensive overview of the status quo of conservation work in the Austrian Green Belt.

The confrontation with so many people's different views on the Green Belt idea led to further questions: Can we speak of an "Austrian Green Belt" in the first place? Do the borderlands differ from the hinterland in regard of their value for conservation of biotopes and species at all? And if so, what exactly is the Austrian Green Belt? A continuous corridor of untouched natural landscapes that we struggle to protect or establish or re-establish? Or is it rather the traditional, diverse cultural landscapes that make the Green Belt valuable and functional as an ecological network?

General approach

Answers to these questions – though far from universal, of course – were found by way of a spatial analysis of the Green Belt's Lower Austrian part. The borderlands of Lower Austria are highly diverse in regard of their natural features, ranging from the dry, steppe-like plains of the south-east to the cool, wet highlands of the Waldviertel and dynamic floodplains along large lowland rivers, from intensively used, large-scale agricultural land to diverse, fine-grained traditional farming landscapes and developing suburban areas. The Lower Austrian Green Belt is therefore very heterogeneous, joining a number of regions with different ecological, cultural and socioeconomic background. It is just like many other parts of the Central European Green Belt, which consist of a mixture of still relatively undisturbed natural landscapes, traditional as well as intensified cultural landscapes and urban areas. It can also be seen as a largely representative sample of Lower Austria's landscapes. Questions like "Is there any ecological justification for the term 'Green Belt' at all, apart from the historic situation?", "Is it reasonable to treat the Green Belt as one interlinked region, even if it is so diverse?" and several more, which this study tries to find answers to, are therefore relevant for many Green Belt regions in Europe as well as for large parts of the Lower Austrian state.

If the Green Belt is to be effectively protected against fragmentation, if it is to be preserved in all its diversity, targeted and coordinated conservation work on a large scale is indispensable. Well-fitted guiding concepts are, in turn, essential for such a large-scale approach because they provide clearly defined, commonly agreed-on aims. How could any large-scale project be successful if there is no clear vision of the common goal? Or if this vision is thoroughly infeasible? What if the project partners have different ideas of how to achieve this goal and have never agreed on the best way to get there? And how could an ecological network ever really be a network if all its parts are treated separately?

The Green Belt's long-term preservation as an ecologically valuable area is dependent on the effective coordination and cooperation between the initiative's members. In order to promote sensible conservation of natural values and linkage of biotopes on a regional and cross-regional scale, it is not sufficient to focus conservation planning and efforts on individual regions. Coordination of conservation work is vital to the integrity of the network and the protection of all its parts, even if they happen to be different.

Based on the conclusions drawn from the analysis of the Lower Austrian Green Belt and with the help of experts on nature conservation in Lower Austria first drafts of guiding concepts were developed in this study. These visions of future Green Belt landscapes, though ambitious and perhaps idealistic, will maybe help to answer the one central question the initiative revolves around: How can we best protect the European Green Belt?

2 The Green Belt's Project History

Since the establishment of the European Green Belt initiative in 2003 various projects on mapping of the area ("GIS Mapping Project" in 2007, see Coordination Group of the European Green Belt Initiative / BUND 2015a), gap analysis, sustainable regional development, sensitive infrastructure development ("GreenBelt Project" in 2008, see Coordination Group of the European Green Belt Initiative / BUND 2015b) etc. were carried out. Starting in 2011 and following two EU-funded Interreg III/IV-B projects on the Central European and the Baltic Green Belt, another Interreg IV B-project on the Central European Green Belt ("GreenNet Project", see Coordination Group of the European Green Belt Initiative / BUND, 2015c) as well as the Research- & Development-project "Advancing the European Green Belt Initiative" (Coordination Group of the European Green Belt Initiative / BUND, 2015d) were finalized in 2014.

The **GreenNet project** aimed to "support and strengthen policies, strategies and approaches that safeguard the interlinked ecological network", focussing on "non-legally or low protected ecologically valuable areas". Among the core outputs were "tool-boxes of methods and strategies for securing the Central European Green Belt in non-protected areas and for dealing with land use conflicts". Some tools are, for instance, meant to raise local people's awareness of the Green Belt's ecological, socio-economic and historic value, focussing on publication of information material and on the "involvement of stakeholders in the process of defining regional safeguarding and development strategies". A second set of tools comprises instruments for "landscape management, alternative agricultural management, integration of nature conservation into strategies for sustainable tourism, changes of ownership structures on the land market and participating planning processes" (Association for Rural Development in Thuringia 2014).

In six pilot regions "local and regional tools, instruments and strategies to enhance nature protection, civil participation and public awareness" were applied (Coordination Group of the European Green Belt Initiative / BUND 2015c). One of them, PR Northern Weinviertel, is located in the Lower Austrian Green Belt and was subject to detailed ecological analyses (Pfundner 2014) and investigations on historic land cover changes (Jamnig et al. 2014).

Furthermore, a “GreenNet Charter” was developed, providing a guideline for development of the Green Belt regions that “integrates ecological perspectives as well as socio-economic requirements” and for the “promotion of the Green Belt in the frame of informal participatory and cooperative decision-making processes”. Among the points on this charter are the “establishment […] of manifold coordination and communication among stakeholders”, the “strengthening of strategic partnerships as a precondition for the harmonised implementation of safeguarding and development instruments” and the “development of the label ‘Green Belt’ as umbrella for all activities promoting the conservation and sustainable development of the Green Belt“ (Association for Rural Development in Thuringia 2014).

These words show clearly that the European Green Belt initiatives’ future success strongly depends on cooperation between stakeholders on all levels and coordination of conservation and development strategies. Public awareness and participation is another key issue for the long-term safeguarding of the Green Belt, as are land use practices in the borderlands. Generally, all recent Green Belt projects indicate that there is a great need for strategic, scientifically based, integrated and coordinated conservation planning in the European Green Belt. The GIS mapping project laid the foundations for that by bringing together data on land cover, ecological value, protection status and projects in a common database (Schlumprecht 2006). For the GreenBelt project a gap analysis was conducted, indicating gaps in regard to legal protection and network integrity as well as threats and valuable but presently non-protected areas (Schlumprecht et al. 2008).

The GreenNet project’s results are meant to bridge the gap between the so far collected mainly ecological data including ensuing recommendations and spatial planning policy, stakeholder integration, etc. However, apart from the more explicit suggestions for the pilot regions, they only give a general overview of applicable instruments and methods for solving spatial conflicts and safeguarding the ecological network.

Of course, detailed analyses of national Green Belt sections go far beyond the scope of any of these transnational projects. Since conservation planning seems to be more effective the more explicit it is, detailed analyses are, however, crucial for the improvement of conservation outcomes. Currently, there is no comprehensive report of the status quo of conservation work in the Austrian Green Belt regions, much less a tool for its coordination or improvement.

3 Concepts and Methods

3.1 Exploratory Interviews: The Austrian Green Belt initiative

As a first step in this study a set of exploratory interviews was conducted.

The **aim** of this introductive survey was to create an overview of organisational structures and activities in the Austrian Green Belt initiative. Therefore, representatives of institutions strongly involved in the Austrian Green Belt initiative were asked for participation.

The **study area** for this first step was the entire Austrian Green Belt, stretching from the border between Austria, Germany and the Czech Republic in north-eastern Upper Austria along the borders of Lower Austria, Burgenland and Styria to the border between Austria, Italy and Slovenia in southern Carinthia. Interviewees were therefore selected to represent all these federal states. Unfortunately, no representative from Carinthia was available for an interview.

The **institutions represented** here are the Austrian League for Nature Conservation (*Naturschutzbund*, ALNC) and the three national parks located in the Austrian Green Belt region (Donauauen National Park, Neusiedler See – Seewinkel National Park, Thayatal National Park).

For comparison between Austrian and German Green Belt initiatives, one representative from the German environment and nature conservation NGO BUND / Bund Naturschutz in Bayern e.V (Friends of the Earth Germany / Bavaria) was interviewed (Table 1, page 16). Bund Naturschutz was the first NGO to engage in the idea of a German Green Belt and still plays a major role in both the German and the European Green Belt initiatives as part of the national association BUND (Geidezis et al. 2014a).

Two of the interviewees hold offices in the European Green Belt initiative in addition to their positions in the respective national institutions: Dr. Liana Geidezis is head of the BUND Project Office Green Belt, which serves as Regional Coordinator for the Central European Green Belt (Geidezis et al. 2014a) and Prof. Univ.-Doz. Dr. Johannes Gepp is National Focal Point for the Green Belt in Austria (Naturschutzbund Österreich 2015).

Furthermore, Alois Lang was IUCN Coordinator for the European Green Belt between 2005 and 2008 (Lang 2013).

The following **topics** were discussed during interviews:

Regarding the Austrian (German) Green Belt initiative…

- …organisation and coordination in regard of administration and conservation planning
- …political and public interest in the Green Belt
- …challenges
- …legal basis and legal protection of the Green Belt
- …the Green Belt's status in spatial planning
- …funding

Regarding aims and guiding concepts for the Austrian (German) Green Belt…

- …overarching aims and main target biotopes for conservation
- … availability of data on species and habitats
- …challenges related to guiding concept formation, coordination and implementation

Table 1: Interviewees in exploratory interviews

Name	**Institution**	**Position**
	Green Belt Germany	
Geidezis, Dr. Liana	BUND / Bund Naturschutz in Bayern e.V. (Friends of the Earth Germany / Bavaria)	Head of BUND Project Office Green Belt, Regional Coordinator for the Central European Green Belt
	Green Belt Austria	
Baumgartner, Dr. Christian	Donauauen National Park	Head of division Nature and Science
Gepp, Prof. Univ.-Doz. Dr. Johannes	Naturschutzbund Steiermark (ALNC[1] Styria)	Chairman of ALNC Styria, vice chairman of ALNC, National Focal Point for the Green Belt Austria
Gross, Mag. Margit	Naturschutzbund Niederösterreich (ALNC Lower Austria)	Director of ALNC Lower Austria

Table 1: Interviewees in exploratory interviews

Name	Institution	Position
Green Belt Austria		
Lang, Alois	Neusiedler See – Seewinkel National Park	Head of division Public Relations and Ecotourism, former IUCN Coordinator for the European Green Belt
Limberger, Josef	Naturschutzbund Oberösterreich (ALNC Upper Austria)	Chairman of ALNC Upper Austria
Michalek, Dr. Klaus	Naturschutzbund Burgenland (ALNC Burgenland)	Director of ALNC Burgenland
Pühringer, Christine	Naturschutzbund Österreich (ALNC)	ALNC project coordinator
Übl, Christian BSc	Thayatal National Park	National park scientific officer

[1] Austrian League for Nature Conservation

The interviews took place between September 2014 and January 2015. They were conducted in private and answers were recorded in writing during the interview. All interviewees were sent the questionnaire beforehand and could prepare themselves if they wished to.

For the **questionnaire** used see Appendix (page 129). Questions referring to one national Green Belt initiative were posed according to the country represented by the interviewee, except for questions 4 and 5. Here interviewees were asked all subquestions referring to both Austria and Germany. All interviewees were asked subquestion 7c referring to Central Europe.

3.2 Spatial Analysis: Status quo of the Lower Austrian Green Belt

Having created an overview of coordination and cooperation within the Austrian Green Belt initiative, a detailed spatial analysis of the Green Belt's Lower Austrian part was conducted.

For this analysis, the **study area** was defined as the entirety of Lower Austrian municipalities intersecting a 10 km wide zone directly adjacent to the state's national border. Since there is no common definition of the European Green Belts spatial extent, past studies have used different delimitations in Austria. During the Interreg IIIB project "GreenBelt" a gap analysis of the Central European Green Belt was conducted on a 100 m wide stretch of land

(50 m to either side of the national borders (Schlumprecht et al. 2008). In Lower Austria a more extensive spatial analysis was added to this basic gap analysis, using a study area of 10 km in width (Naturschutzbund Niederösterreich 2008).

For the study at hand, a municipality-based approach was chosen. Relating analysis results and management suggestions to existing administration units might facilitate their implementation (Wrbka et al. 2004). On one hand, politicians, planners, etc. can directly relate the information provided to familiar administration units. On the other hand, breaking down results to address individual municipalities makes it easier to find contact persons or agencies responsible for their implementation. The geodata on municipal borders and the Lower Austrian border was taken from Austria's open data portal data.gv.at.

The main **aim** of this spatial analysis was to produce a basis for the development of common guiding concepts for groups of municipalities and thus enhance coordination and cooperation among Austrian Green Belt regions. For this, three grouping factors on municipal level were defined: Cultural Landscape Class, Conservation Value and Protection Status were used to define groups of municipalities similar in one or more respects. These three factors can be seen as hierarchical: First drafts of guiding concepts are developed on the basis of cultural landscapes and their specific potential for nature conservation. Then, (semi-) natural biotopes embedded in the landscape matrix as well as landscape fragmentation are taken into account. Finally, the current legal protection is considered to refine guiding concepts once more.

The factors "mean distance from border" and "mean altitude" were introduced in order to analyse the difference in Conservation Value between municipalities in various locations in the Green Belt region. Altitude might also play a part in the distribution of Conservation Values and was therefore considered as well.

For spatial analyses ESRI's ArcMap 10.1 and 10.2 were used. Geodata was uniformly projected in Lambert's Azimuthal Equal Area coordinate system to obtain equal-area results.

3.2.1 Cultural Landscape Classes

Cultural landscapes constitute a large part of the Lower Austrian Green Belt. In most regions, they take up far more space than (semi-) natural biotopes. If an ecological network in this region is meant to be established or preserved, land used for agriculture or forestry will

inevitably be part of it. Its spatial configuration, diversity, land use intensity and richness in landscape elements determine suitability as habitat for animal and plant species and thus its value as part of the ecological network. Cultural landscapes' contribution to the Green Belt's preservation could be essential (Esbah et al. 2012) and they should therefore be carefully considered and included into conservation planning.

For the development of guiding concepts municipalities were, inter alia, classified according to the types of cultural landscapes they feature. The classification was based on an existing dataset on Austrian cultural landscape types, which comprises a nation-wide spatially comprehensive classification of Austrian landscapes, grouping them into 42 cultural landscape types according to landform and land use (Schmitzberger et al. 2003). For a list of cultural landscape types occurring in the Lower Austrian Green Belt see Appendix (Table 10, page 128).

Again, an area-based approach was chosen. Each cultural landscape type's share of each municipality's area was calculated and municipalities were then grouped according to the combination of landscape types they featured. An agglomerative hierarchical clustering method in R 3.1.2 (Ward's minimum variance method) was used. The number of clusters was set to six, which proved to deliver the most useful clustering.

3.2.2 Conservation Value

In order to classify municipalities according to their richness in natural and high-value cultural landscapes and landscape elements, a "Conservation Value Index" was created. Along with the Cultural Landscapes Classification and the Protection Status Index it is meant to be used for grouping of municipalities and subsequent development of common group-specific guiding concepts.

The index indicates the density of valuable natural features, such as (semi-) natural biotopes, landscape elements and cultural landscapes worthy of conservation, thus providing a means to gauge the status quo of nature conservation in the Lower Austrian Green Belt municipalities and facilitate prioritization of measures and selection of the most suitable conservation approaches in each group.

This index cannot be seen as a measure of landscapes' biodiversity or relevance for nature conservation. It does neither reflect species or habitat diversity nor presence or absence of endangered species and biotope types. As a simplifying conservation status measure its

purpose is to enable the adaption of general conservation concepts to regionally different requirements. The index contains no information about individual biotope areas, threats or management of valuable landscapes or any specific conservation requirements. It is therefore not meant to substitute detailed local analyses of these natural assets, which is of course necessary for their effective protection. Much rather can it be used for the formation of a general conservation concept that might facilitate cooperation and coordination within Green Belt regions of similar conservation issues. This cooperation and coordination of conservation efforts is, after all, one of the Green Belt idea's essential components.

The Conservation Value Index (CV) is conceptually based on an adapted version of O'Neill's Urbanity Index (UI, O'Neill et al. 1988) introduced by Wrbka et al. in 2004:

$$UI = \log 10 \left(\frac{U + A}{F + W + B} \right)$$

where U = urban area, A = agricultural area (croplands and agriculturally used grasslands), F = forest areas, W = water and wetland areas and B = natural or semi-natural biotopes.

The Urbanity Index reflects the extent to which landscapes are dominated by strongly human-altered systems and can be used as a landscape naturalness indicator (Wrbka et al. 2004).

The above formula was adapted to shift the focus towards landscapes' richness in (semi-) natural biotopes and ecologically valuable cultural landscapes and the degree of their fragmentation, i.e. their general "conservation value":

$$CV = (F + B + NM + CL - U) * FRAG$$

The **variables** used are listed below. In the following, the term "area" always refers to a proportion of a municipality's total area. The indicator variables' values may therefore range between 0 and 1.

- F = forest area. This data was derived from the Lower Austrian Forest Development Plan (*Niederösterreichischer Waldentwicklungsplan*, 2014). Since no up-to-date data on Lower Austria's forests' conservation value was available, areas classified as protective forests in the Forest Development Plan were used to approximate near-natural forest occurrence. Two types of protective forests are listed there: Object and site protection forests, the former of which protect human settlements, infrastructure

and agricultural land against natural hazards and harmful environmental influences. The latter protect soils against erosion (Schima et al. 2012). The Forest Development Plan comprises point (forest areas < 100.000 sqm) and polygon (> 100.000 sqm) data, of which only the latter was used. Point data did not include indications of the actual forest area on the respective site and could therefore not be considered. The dataset was provided by the Lower Austrian State Government Office's department of forestry.

- B = (semi-) natural biotope area. This data was derived from several source datasets on different biotope types, namely bogs and mires (B_B), dry grasslands (B_D), floodplains (B_F) and wetlands (B_W).
    - Austrian Catalogue of Bogs and Mires (Steiner, G.M. 1992: Österreichischer Moorschutzkatalog, Grüne Reihe des Bundesministeriums für Umwelt, Jugend und Familie)
    - Austrian Catalogue of Dry Grasslands (Holzner, W. (ed.) 1986: Österreichischer Trockenrasenkatalog, Grüne Reihe des Bundesministeriums für Umwelt und Gesundheit (updated in 2013))
    - Inventory of Floodplains in Austria (Lazowski, W. et al. 2011: Aueninventar Österreich. Bericht zur bundesweiten Übersicht der Auenobjekte.)
    - Inventory of Wetlands in Austria (Oberleitner, I. & Dick, G. 1996: Feuchtgebietsinventar Österreich. Grundlagenerhebung.)
- NM = Natural Monuments designated according to the Nature Conservation Act of Lower Austria (§12 Lower Austrian Nature Conservation Act 2000). The official geodata on Lower Austrian Natural Monuments features point and polygon sites. Since the Conservation Value index is based on biotope area, only the latter sites were used. Also, small point monuments like single trees or rocks cannot be considered relevant for a landscape's overall conservation value and were therefore not included in the analyses. The data used was provided by the Lower Austrian State Government Office.
- CL = high-value cultural landscape area. This variable replaces the original variable A (agricultural area). The dataset was produced by Wrbka et al. in 2005. Instead of using the total municipal agricultural area, distinctions were made according to

conservation value (Wrbka et al. 2005). High-value cultural landscapes were considered to be of equal importance for nature conservation as natural biotopes and were therefore added to the index as an indicator variable for high conservation value. Parts of cultural landscape polygons overlapped by forests, biotopes, Natural Monuments or urban areas were digitally removed and did not contribute.

- U = urban area. A dataset aggregated from the official Lower Austrian municipal zoning plans (provided by the Lower Austrian State Government Office) was used to delimit urban and built-up areas on the map. Land designated for building as well as industrial and operation areas and associated urban zones like recreation and sports facilities, playgrounds, graveyards etc. were considered. Wind power plants, dumpsites, quarries, sand pits and waste treatment plants were not included because data on these zones was very inconsistent (faulty delimitation, outdated zoning etc.). Also, the impact on their surroundings is often not directly related to their area. Wind power plants, for example, affect large areas that cannot be easily delimited on a map.
- $FRAG$ = fragmentation. The fragmentation measure Effective Mesh Size was used here. It is especially suitable for comparing fragmentation between regions of different total sizes (Jaeger 2000). An improved version using a cross-boundary connection procedure (Moser et al. 2007), i.e. ignoring municipal borders in the calculations, could not be used due to lack of detailed data on land cover in adjacent Czech and Slovakian regions. The land cover map necessary for calculation of the measure was produced using the abovementioned urban areas and additional datasets on railways and roads. The latter dataset included motorways, primary and secondary roads. Urban areas were aggregated using an aggregation distance of 100 m, 20 m minimum polygon area and 100 x 100 m minimum hole area. These values proved to deliver the most reasonable results when comparing the obtained urban aggregates to aerial photographs of the towns. Based on the network of roads, railways and urban areas, the effective mesh size was calculated using the ArcGIS 10 tool “Polyfrag” (MacLean, University of New Hampshire, 2013). For calculation of the Conservation Value index the effective mesh size was considered a proportion of the respective municipal area, so that $FRAG$ values ranged between 0 and 1.

While Wrbka et al. (2004) use "$U + A$" as denominator, U is subtracted from the sum of F, B, NM and CL in the Conservation Value Index formula. This is because U's influence on the index is meant to be rather small compared to the other variables' impact. In order to be able to multiply U by a weighting factor (see below) it could not be used as denominator.

Fragmentation was added as a multiplying factor because of its strong effect on the entire landscape's structure and conservation value. It has often been shown that habitat fragmentation effects exceed local scale and can affect species populations in large areas (Ewers & Didham 2006). Fragmentation by roads and railways also leads to increased human disturbance and degradation of areas directly associated with traffic infrastructure, e.g. by noise and light pollution as well as pollution of air, soil and water or littering (Fahrig & Rytwinski 2009, Kociolek et al. 2011, Lee et al. 2012). Its influence on the quality of sites considered valuable for nature conservation must therefore not be underestimated.

In order to equalize variables' effects on the index **weighting factors** were used (Table 2, page Table 2: Weighting factors for Conservation Value indicator variables24). This was necessary due to very different mean areas between the categories of (semi-) natural biotopes (wetlands, floodplains, dry grasslands, bogs and mires), forests, cultural landscapes and urban areas. Since source datasets were produced using different mapping methods the resulting areas cannot be treated equally. Digital delimitation of polygons is much less accurate for large sites, such as floodplains, wetlands and cultural landscapes. These large polygons often include traffic infrastructure, small built-up areas and other patches of low value for nature conservation, which leads to overestimation of the associated variables. Large biotopes would overly influence the index value also because their spatial extent is per se greater. In contrast, variables for dry grassland areas and bog and mire areas, which are usually small in present day Central European landscapes, would only have very small effects on the index value.

Of course one may argue that especially dry grasslands used to stretch over vast expanses of land in past centuries and still did in some regions only decades ago. Their reduction to small patches can be attributed to destruction or degradation, which of course affects all types of natural biotopes. The index value should therefore reflect small dry grassland patches just as negatively as any other small biotope patch. However, since this study is meant to assess current conservation values on municipal level, the focus does not lie on a hypothetical, ideal state of the landscapes or on past processes of degradation. The index should rather focus on

existing features in need of conservation. First and foremost, it is meant to positively reflect natural values rather than to paint a dramatic picture of how much has been lost.

Table 2: Weighting factors for Conservation Value indicator variables

category	**median area per municipality [sqm]**	**weighting factor**
small biotopes ($\boldsymbol{B_S}$), i.e. $\boldsymbol{B_B}$, $\boldsymbol{B_D}$ and Natural Monuments ($\boldsymbol{NM}$)	48014	1^{-1}
large biotopes ($\boldsymbol{B_L}$), i.e. $\boldsymbol{B_F}$ and $\boldsymbol{B_W}$	1563215	33^{-1}
forests ($\boldsymbol{F}$)	814708	17^{-1}
high-value cultural landscapes ($\boldsymbol{CL}$)	9329424	194^{-1}
urban areas ($\boldsymbol{U}$)	1074933	22^{-1} / 2 = 44^{-1}

The weighting factor for each variable is the rounded median of each category's total municipal area to the power of -1. Floodplains and wetlands, i.e. the large biotope types, as well as bogs and mires and dry grasslands, i.e. the small biotope types, and Natural Monuments were summarized and given the same weighting factor derived from their common median.

Using this approach to calculate weighting factors, high or low values for a certain indicator variable in a specific municipality can be seen as deviations from the median. That means that the municipality in question e.g. features smaller or larger biotope areas than others, and its Conservation Value is thus positively or negatively influenced. In order to avoid strong influence of small artefact polygons, resulting e.g. from digital intersection between sites and municipal borders, the median was chosen over the arithmetic mean for this calculation. Furthermore, the weighting factor for urban areas was divided by 2 since their influence on the index value was meant to remain rather small, and a weighting factor of 44^{-1} was found to be suitable.

$$CV = (B_S + \frac{B_L}{33} + \frac{F}{17} + \frac{CL}{194} - \frac{U}{44}) * FRAG$$

In addition to these categorical weighting factors, each dry grassland, bog, floodplain and wetland was assigned a **"relative importance"**. These categories' source datasets included importance values, which reflected the individual sites' importance for nature conservation. The values ranged between 1 and 4 or 5, depending on the source dataset (1-5

for dry grasslands, bogs and mires and floodplains, 1-4 for wetlands). In order to make them comparable, values were related across all categories and reduced to a 3-level scale (1 = local importance, 2 = regional importance, and 3 = (inter)national importance). Internationally important sites therefore influenced the municipal Conservation Value more strongly than merely locally important sites, for example.

For cultural landscape areas, only the top three levels of the source dataset's original 5-level scale were used. I.e., only cultural landscape areas of the top three importance values were included as index variables in the first place. These areas, also, were furthermore multiplied with their respective importance value (1-3).

Generally, no **overlaps** between areas of different categories were tolerated. Any overlaps resulting from the listing of areas in more than one source dataset were eliminated according to the following rules:

- High-value cultural landscape areas (CL) were treated with the lowest priority, i.e. overlapping areas of any other category were used to digitally erase the underlying CL area.
- Natural Monuments (NM) were treated with second-to-lowest priority. This is because their designation is not based on systematic mappings and can therefore not be considered representative.
- Forest areas (F) were used to digitally erase overlapping NM and CL areas but were treated with lower priority than biotope areas. F areas only approximate forests of high conservation value (see above) and can therefore not be considered as relevant as biotope areas.
- Biotope areas (B) were treated with second-to-highest priority. Overlaps between these categories were treated according to the individual sites' relative importance (see above): Sites of higher relative importance were prioritized. Where sites of similar relative importance overlapped, bogs and mires and dry grasslands were prioritized over floodplains and wetlands. The former two biotope categories' areas are generally smaller and more accurately delimitated than the latter two's. Thus, keeping their ecological characteristics in mind, they may occur within large wetland or floodplain

areas and influence the index more positively than those biotopes, since their weighting factor is larger.

- Urban areas (U) were treated with the highest priority because they generally prevent the occurrence of high-value biotopes, cultural landscapes, forests or Natural Monuments. Overlaps between these and U areas can be attributed to delimitation errors and inaccuracies.

Areas of less than 20 sqm in size were generally eliminated from the dataset. This threshold was defined arbitrarily to avoid small digitalization and intersection artefacts in the data.

In a last step, index values were scaled between 0 and 1, setting the maximum occurring index value to 1. Negative index values were replaced by 0 because they are conceptually pointless: The value of a landscape for nature conservation cannot be less than none. Thus, Conservation Values range between 0 and 1.

After calculation of the index values, municipalities were grouped into five classes (very high, high, medium, medium low and low) using quantiles as class limits: 20%-quantile = 0.00656, 40%-q. = 0.01818, 60%-q. = 0.03195 and 80%-q. = 0.0585. These classes were used for the grouping of municipalities in regard of guiding concept development. For statistical analyses the original continuous values were used.

3.2.3 Protection Status

The extent and level of legal protection is an essential factor for the conservation of valuable biotopes. Even though legal protection does not always ensure the effective preservation of species and their habitats, it is unquestionably a very important tool for nature conservation and a key issue within the Green Belt initiative. Any kind of legal protection strongly affects the preconditions for conservation planning and implementation of measures in the protected areas. This factor must therefore not be ignored during the process of guiding concept development. The Protection Status index is primarily meant to facilitate prioritization and adaption of conservation approaches and measures in the Lower Austrian Green Belt.

The index combines coverage of the four (semi-) natural biotope categories (dry grasslands, bogs and mires, floodplains and wetlands) by protected areas with the level (strictness) of their legal protection (i.e. protected area category). It does not measure the total proportion of municipal area under legal protection, so that, for instance, municipalities with large

protected areas covering only a small part of their (semi-) natural biotopes obtain a low Protection Status value. Also, this index does not reflect the density of biotopes worthy of legal protection (cf. Conservation Value!). It is solely a measure of the present biotopes' legal protection.

Natural Monuments, high-value cultural landscapes and forests were not considered here. Since the index is meant to reflect the degree to which valuable sites are protected by law, including areas protected per se, like Natural Monuments, would be unreasonable. Cultural landscapes and protective forests both are mostly highly human-altered areas. These are seldom protected by law and their legal protection would probably be neither feasible nor useful.

The protected area categories considered are

- national parks (Lower Austrian State Government 2013a),
- nature protection areas (*Naturschutzgebiete*, Lower Austrian State Government 2013b)
- landscape protection areas (*Landschaftsschutzgebiete*, Lower Austrian State Government 2013b)
- Natura 2000 sites (*Europaschutzgebiete*, Lower Austrian State Government 2013b) and
- Ramsar sites (UNESCO Office of International Standards and Legal Affairs 1987).

The geodata on these sites was provided by the Lower Austrian State Government Office.

In order to obtain one single Protection Status value (PS) for each municipality, the proportion of (semi-) natural biotopes covered by any category of protected area (PPB, "**proportion of protected biotopes**") was calculated in a first step:

$$PPB = \frac{B_{protected}}{B_t}$$

where $B_{protected}$ denotes the total municipal (semi-) natural biotope area under any kind of legal protection and B_t denotes the total (semi-) natural biotope area within a municipality (protected and unprotected).

Then, weighting factors for the different protected area categories were introduced. $B_{protected}$ was thereby broken down into six different indicator variables: Biotope areas

under protection by a national park (Lower Austrian State Government 1996, Lower Austrian State Government 2008) were multiplied by 10, areas protected under the Habitats Directive ("FFH sites", Lower Austrian State Government 2011) by 8, nature protection areas (*Naturschutzgebiete,* Lower Austrian State Government 2014) by 7, areas protected under the Birds Directive ("bird sanctuaries", Lower Austrian State Government 2011) by 5, areas protected by the Ramsar Convention ("Ramsar sites", Secretariat of the Convention on Wetlands 2015) by 4 and landscape protection areas (*Landschaftsschutzgebiete,* Lower Austrian State Government 2006) by 2. Where two or more categories overlapped, only the category weighted higher was considered.

Thus, the **Protection Status** is

$$PS = \frac{B_{NP} * 10 + B_{FFH} * 8 + B_{NPA} * 7 + B_{BS} * 5 + B_R * 4 + B_{LPA} * 2}{B_t}$$

where and B_{NP}, B_{FFH}, B_{NPA}, B_{BS}, B_R and B_{LPA} denote the biotope areas protected by national parks, FFH sites, Nature Protection Areas, bird sanctuaries, Ramsar sites and Landscape Protection Areas, respectively.

Index values could theoretically range between 0 and 10, with higher index values reflecting larger proportions of protected (semi-) natural biotopes per municipality and stricter protection. After calculation of the index values, municipalities were grouped into six classes: "No protection" (i.e. municipalities with solely unprotected (semi-) natural biotopes, Protection Status = 0), low (>0 and <2), medium low (≥2 and <4), medium (≥4 and <6), high (≥6 and <8) and very high (≥8 and ≤10) Protection Status. Municipalities with no (semi-) natural biotopes at all were excluded from the classification.

Additionally, the **level of legal protection** (LP) was calculated:

$$LP = \frac{B_{NP} * 10 + B_{FFH} * 8 + B_{NPA} * 7 + B_{BS} * 5 + B_R * 4 + B_{LPA} * 2}{B_{protected}}$$

LP is not affected by the proportion of protected biotopes PPB. It simply measures the strictness of current legal protection and thus complements the Protection Status index in a useful way.

3.2.1 Mean distance from border and mean altitude

The need for preservation of the European Green Belt is mainly justified by an alleged particularly high density of valuable (semi-) natural biotopes in proximity to the former Iron Curtain. For Lower Austria, this assumption is based primarily on the occurrence of large natural biotope areas, such as floodplains along the rivers Lužnice (*Lainsitz*), Dyje (*Thaya*), Morava (*March*) and Danube (*Donau*) or dry grassland complexes in the surroundings of Hainburg an der Donau and Retz (various authors in Gepp 2010). Cultural landscapes close to the former Iron Curtain, as well, might be less intensively used and still harbour a larger amount of biotope areas than more distant ones. The landscapes' Conservation Value is thus supposed to decrease as distance to the border increases and the Iron Curtain's effects diminish. In order to investigate this relationship the distribution of Conservation Values was analysed in regard of municipalities' distance from the border.

Altitude might also have an effect on the ecological value of cultural landscapes and the preservation of biotopes. Because of pronounced relief and rough climate, landscapes in high altitudes are often less intensively used than lowlands. For the question about a relationship between Conservation Value and distance from the border, the potential co-factor "altitude" is, however, rather irrelevant. The exact reason for the distribution of Conservation Value in the Lower Austrian Green Belt is unimportant for the justification of its protection, as long as Conservation Value is higher in the borderlands than elsewhere. Even so, the factor "mean altitude" was included for the sake of completeness.

The **factor "distance from the border"** was calculated using the least distance between the Lower Austria national border and each municipality's centroid. The results were assigned to one of three predefined groups (A: distance border - centroid < 5 km (n = 49), B: dist. ≤ 10 km (n = 30), C: dist. > 10 km (n = 28)). Municipalities directly adjacent to the national border were automatically classified as group A.

The **factor "mean altitude"** was calculated from a digital elevation model of Austria. The grid values used there are altitude classes, ranging from 0 – 50 m.a.s.l. to 1100 – 1500 m.a.s.l. in Lower Austria. For each municipality a mean altitude class was calculated, resulting in five groups: 100 – 200 m.a.s.l. (n = 36), 200 – 300 (n = 31), 300 – 500 (n = 9), 500 – 700 (n = 27) and 700 – 900 m.a.s.l. (n = 4).

3.3 Expert interviews: Guiding concepts for the Lower Austrian Green Belt

The spatial analyses described above delivered the basis for the next step: Development of guiding concepts for nature conservation in the Lower Austrian Green Belt regions. A second round of interviews was conducted with a number of experts on nature conservation in Lower Austria (Table 3).

Two main **objectives** were pursued in these interviews: Firstly, the collection of information on nature in the Lower Austrian Green Belt regions and suggestions for its protection and development, i.e. the accumulation of components that could later be combined to form guiding concepts. Secondly, the methodology employed for the preceding spatial analyses was subject to scrutiny during the interviews. Thus, valuable suggestions for improvement of classifications and index calculations could also be collected.

The following **topics** were discussed during interviews:

- Guiding concepts, i.e. target states of landscapes and regions (differentiated by Cultural Landscape Classes and Conservation Value)
- Indicator and flagship species for these regions
- Conservation measures for landscapes and biotopes (differentiated by Cultural Landscape Classes, Conservation Value and Protection Status)

Interviewees were selected for their knowledge of Lower Austrian Green Belt regions and their field of expertise, so as to ensure coverage of all Green Belt regions as well as of various taxonomic groups and biotope types (Table 3).

Table 3: Interviewees in expert interviews

Name	Institution	Field of expertise	Involvement in Green Belt work
Denner, DI Manuel	Freelance landscape planner	ornithology, orthopterology	involved in GreenBelt project (mapping)
Egger, Gerhard	WWF	vegetation ecology of floodplains	using Green Belt as a “role model” for biotope networking projects; involved in mapping of protected areas in Morava-Dyje floodplains
Frank, Mag. DI Bernhard	Lower Austrian State Government - Nature	vegetation ecology, conservation management	involved in GreenNet project

Table 3: Interviewees in expert interviews

Name	Institution	Field of expertise	Involvement in Green Belt work
	Conservation Department		
Gross, Mag. Margit	Lower Austrian League for Nature Conservation (LALNC)	herpetology, conservation management	involved in all LALNC projects related to the Green Belt
Kraner, Robert	Energy and Environment Agency of Lower Austria (eNu)	education, soil ecology, stakeholder networking	none
Lazowski, Dr. Werner	freelance ecologist	vegetation ecology, floodplains and wetlands ecology and restoration	involved mainly in relation to floodplains, esp. Morava-Dyje floodplains
Mitterstöger, DI Thomas	Energy and Environment Agency of Lower Austria (eNu)	rural development, landscape planning, protected area networks	involved via the network of protected areas in the "Weinviertel" region
Nüsken, DI Ute	AURING Association	ecological education, herpetology	involved as contact point for LALNC in the northern Morava-Dyje floodplains
Prähofer, DI Gerhard	freelance landscape planner	landscape architecture and planning, conservation planning	none
Übl, Christian Bsc	National Park Thayatal	biological research and management, education	National Park is in contact with the GB idea and activists
Sachslehner, Dr. Leopold	Vienna Institute for Nature Conservation and Analyses (VINCA)	ornithology, animal ecology	involved in GreenBelt project (mapping)
Schmidt, Mag. Axel	freelance biologist	herpetology, ecological education	involved in GreenBelt project, publication, touristic activities (Natura Trail)
Steiner, Dr. Erich	State Museum of Lower Austria	ornithology, ecological education	marginally involved, e.g. via cooperation for wandering Green Belt exhibition
Steiner, Univ.-Prof. Dr. Gert-Michael	University of Vienna	botany, ecology and vegetation of bogs and mires	none
Zuna-Kratky, Dr. Thomas	freelance landscape ecologist	ornithology, orthopterology, botany, applied conservation biology	involved via projects in the Morava-Dyje floodplains, cooperation with LALNC

During the interviews maps of the Lower Austrian Green Belt demonstrating municipalities' Cultural Landscape Classes, Conservation Value and Protection Status were presented to the interviewees. The questions partly referred to these maps.

The interviews took place in April and May 2015. They were conducted in private and written notes as well as voice recordings were taken. Some interviewees asked to be sent the **questionnaire and maps** beforehand so as to be able to prepare themselves. For these documents see Appendix (page 129).

4 Results

4.1 Exploratory interviews

Please **note** that the following sections 4.1.1 and 4.1.2 are a compilation of information obtained during the exploratory interviews. The results stated here reflect the interviewees' answers to the questionnaire (see Appendix, page 129) as well as further comments and have not been verified. Exceptions are statements with indicated sources. If not specified otherwise, statements refer to the Austrian or German Green Belt region or branches of institutions and activities associated with it and cannot be extrapolated.

4.1.1 The Austrian Green Belt initiative

The first set of questions revolved around **organisation and coordination** of the Austrian Green Belt initiative. The Austrian League for Nature Conservation (*Naturschutzbund*, ALNC) was named as the main and most important organisation involved in the initiative by all interviewees. They have been pushing the notion of an Austrian Green Belt since 2003, when the development of the European Green Belt was initiated. Even though one interviewee said that there was no organisation thoroughly embodying the Austrian Green Belt initiative, all interviewees felt that ALNC represented the Austrian Green Belt initiative best.

Other institutions involved in the Austrian Green Belt initiative are the University of Vienna, the University of Natural Resources and Life Sciences, Vienna (*BOKU*), the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (*Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft*), Regional Management Burgenland and the National Parks located in the Green Belt region. Some individual municipalities and the "Mühlviertler Waldhaus" association were also named.

In contrast to ALNC, most of these institutions only contribute to the initiative within the context of projects. While ALNC is considered to be a central contact point for issues related to the Austrian Green Belt both during and outside projects, they also lack financial resources for continuous conservation work on the Green Belt.

Due to the organisational structure strongly dominated by ALNC, coordination of the initiative is mainly an issue among ALNC's federal state branches. Feelings concerning this coordination

were mixed: Some interviewees thought that communication is relatively good among the state branches and mentioned regular meetings and exchange, others said that there was little or no exchange or cooperation concerning the Green Belt outside of projects. Conservation activities are almost exclusively coordinated within the individual state branches.

Locally, there is quite a lot of (often cross-border) cooperation with local or regional institutions both within the nature conservation sector (e.g. within the international working group Bavarian Forest - Bohemian Forest - Mühlviertel (*IAG*), and the Green Heart of Europe (*Grünes Herz Europas*)) and cross-sectoral, e.g with tourism and agriculture. Some interviewees thought that cross-border and cross-sectoral cooperation should generally be more strongly promoted in the Green Belt initiative.

When asked for reasons for the present situation concerning cooperation and coordination among stakeholders in the Green Belt region, one interviewee said that the Austrian Green Belt's missing trademark protection might be a factor. Since there is no obligation to report usage of the label many activities could be going unnoticed by ALNC or any other institution officially involved in the initiative.

Cooperation and coordination are furthermore hindered by ALNC's limited financial resources, which, for instance, do not allow for participation in international meetings outside of projects. They might also be restricting national coordination independent from projects.

These financial limitations were also mentioned by the National Parks' representatives as a reason for their highly focussed cooperation with other protected area administrations. None of them considered cooperation with ecologically different protected areas worthwhile, the only exception being the "Nationalparks Austria" membership, which was found to be beneficial for marketing and funding purposes. Even though the National Parks were mentioned as organisations important to the Austrian Green Belt initiative by ALNC representatives, the National Parks' representatives themselves did not feel that being part of the Green Belt was important or even relevant for their respective organisation.

Furthermore, it was said that the Austrian Green Belt initiative's cross-border activities were not extensive enough and that cross-border cooperation within the frame of National Park administration was established independently from the initiative anyway. It was also mentioned by ALNC representatives that they felt international activities and projects were very time-consuming and costly and often associated with deterrent bureaucratic hurdles.

Coordination in regard of conservation planning was judged differently by the interviewees. One interviewee said that ALNC's goals for conservation along the Green Belt were clearly defined, others felt that there were no coordination or commonly defined goals whatsoever. One person mentioned the "unspoken" common aim of preserving the Austrian Green Belt's diversity. Some said that networking among the state branches occurred only within projects, outside of which each state branch worked separately. Interviewees also emphasized that nation-wide coordination of the Green Belt's conservation was ALNC's national branch's task, whereas the state branches focussed on practical work.

When asked to judge motivation and team spirit in the Austrian Green Belt initiative, interviewees thought that people involved in the initiative were highly motivated and committed. ALNC's general motivation concerning the Green Belt appeared to be high to all interviewees too but some of them added that the Austrian Green Belt initiative's progress was mainly dependent on a few individual persons.

With regard to **political interest** in the Green Belt interviewees felt that the situation was very difficult. Examples given were minimal government funding by the Austrian Ministry for Agriculture, Forestry, Environment and Water Management and deliberate non-use of the label "Green Belt" for projects in the Green Belt region. The facts that the Green Belt is largely unknown to the Austrian public and that most politicians and officials have no personal connection to the initiative were named as reasons for low political interest. However, lack of funds for the Green Belt's promotion and its missing legal basis make an improvement of this situation very difficult.

Concerning **public attitude** interviewees had different experiences: One felt that the general public was interested in the idea, especially when eco-touristic approaches were used, another one said that in some regions negative feelings about the Green Belt prevailed and that people still experienced the open border as threatening.

Low public interest was also said to be due to the Green Belt's general invisibility and impalpability. One of the National Parks' representatives said that visitors showed no special interest in the Green Belt, others added that it did not enhance park visitors' nature experience and that the "Green Belt" label was therefore not used in the parks. One ALNC representative thought that the label was not meaningful enough to be used by National Parks or other institutions, whether as an added value or individually.

One interviewee said that the Green Belt was per se a difficult concept to communicate to the public, even more so because the actual near-natural corridor created by the Iron Curtain does not cross Austrian grounds.

Interviewees were furthermore asked to name **challenges** the Austrian Green Belt initiative faces.

The threats to nature conservation they listed are fragmentation of the Green Belt by traffic infrastructure, construction and run of hydro power and wind power plants, agricultural intensification and building activity. One interviewee suggested securing of valuable sites for nature conservation and establishment of further protected areas as ways to go against these developments. Also, the implementation of ecological networks in spatial planning needed to be facilitated.

Among the challenges related to politics and economy were the Green Belt's missing legal basis, absence of responsible state officials, minimal government funding and imbalance of tourism and nature conservation. Also, one National Park's representative suggested that an EU strategy for the European Green Belt similar to the EU Strategy for the Danube Region (European Commission 2010) would be very beneficial. Currently, the European Green Belt could not be attributed to a single region and therefore fell out of many existing subsidy schemes, which made the acquisition of promotion funds for large-scale Green Belt projects impossible. EU funding, however, was considered crucial for conservation work.

Two interviewees thought that a national Green Belt organisation were beneficial as it would embody the whole initiative and help securing funds. Also, the Austrian National Focal Point position should be occupied by a state official, who could acquire more government funding and increase political support of the initiative.

Participants were also asked for an **international comparison** between the Austrian and other national Green Belt initiatives in regard of team spirit, motivation and coordination. One interviewee thought that the Austrian initiative came (a distant) second to the German initiative and could still be considered exemplary on European level, another one said that it was about equal to other Green Belt countries' initiatives. Generally, representatives felt that a lot more could be done with sufficient funding and increased public and political interest.

Structure and coordination of the Austrian and the German Green Belt initiatives are very different. The German BUND serves as the main contact point for matters related to nature conservation in the German Green Belt. It maintains a project office (BUND Project Office Green Belt, Nuremberg) entrusted with the continuous nation-wide coordination of all official projects related to this region and cooperating, for instance, with federal agencies and nature conservation foundations. Paid staff and volunteers are concerned with the Green Belt on BUND's various administrational levels (national, federal state, county and municipal level). The German interviewee even said that BUND considered the Green Belt their flagship project.

To all interviewees the German Green Belt initiative seemed generally more advanced than the Austrian, mainly due to its earlier initiation, Germany's former separation and the resulting emotionality concerning the former border, and due to BUND as a strong and well-established carrier of the initiative. Other reasons mentioned were a greater public interest and more media networks for the German Green Belt and the fact that it was and still is state-owned to a great extent. However, the BUND representative added that the German initiative's team spirit only started to grow strong about a decade after the initiative's foundation. Especially the transfer of Green Belt areas (formerly owned by the German state) to the federal states allowed a major leap forward. She also mentioned that the long-term staff working for the Green Belt were an important factor and brought steadiness to the initiative.

One set of questions revolved around the Green Belt's **legal basis.** As mentioned above, there is no legal basis for the Austrian Green Belt whatsoever. The land in the Green Belt region is private property to a great extent, often owned by aristocratic great landowners and monasteries. There is also some land owned or leased by the federal states, e.g. public waters, national parks and nature protection areas (*Naturschutzgebiete*). ALNC owns only a very small portion of the Austrian Green Belt. One interviewee emphasized that the actual "central" Green Belt, i.e. die stretch of land directly associated with the Iron Curtain's border fortifications, is not located on Austrian territory. Therefore the Austrian Green Belt cannot be compared to the German Green Belt in regard of ownership structure.

When asked about **legal protection status**, interviewees could not specify the exact share of protected areas in the Austrian Green Belt. They said that protected areas of various categories were dense in the Green Belt region but thought that this was due to the high

density of ecologically valuable areas in the border regions rather than to any awareness of the Green Belt idea itself. One interviewee estimated that about a fifth of the Austrian Green Belt was legally protected and said that Austria had a backlog to clear regarding protected areas in intensively used lowlands and cross-border protected areas in general.

In Germany, about two thirds of the Green Belt's entire length are protected by law. The German interviewee said that legal protection of the entire German Green Belt was the only way to ensure its conservation. She added, however, that different opinions existed among the initiative's members concerning such complete legal protection.

In Germany as well as in Austria, the Green Belt per se is not implemented in **spatial planning**. However, one representative said that planners were conscious of the border regions' special situation and that this could actually be a basis for the Austrian Green Belt's development. Generally, nature conservation issues are considered in Austrian spatial planning to a certain extent but situations differ between federal states.

One set of questions revolved around **funding** of conservation activities and scientific research related to the Green Belt. ALNC representatives said that external funding was limited to individual projects, which made continuous work on the Green Belt impossible. The initiative was called a "switch on / switch off" initiative. Even Austria's National Focal Point is not funded project-independently and ALNC's participation in international Green Belt meetings is also dependent on project-related resources. Projects funded externally, e.g. by the European Union, federal ministries and states, were therefore said to be crucial for the NGO's work. One interviewee, however, emphasized that such financing inhibited cross-sectoral activities and enhancement of public relations and thought that this was one of the main challenges the European Green Belt initiative faced. Cooperation between nature conservation and the (regional) economic sector was suggested as a way to acquire funds for conservation activities and at the same time increase public and political interest in nature conservation.

4.1.2 Aims and guiding concepts

Among the answers to the question about an **overarching aim** for the Austrian Green Belt, two points of view can be distinguished:

Firstly, many ecological goals were mentioned, some of them very concrete (safeguarding of specific ecologically valuable areas) and some more general (conservation of the Green Belt's landscape and species diversity, enhancement of the biotope network, prevention of further fragmentation).

Secondly, some interviewees had rather cross-sectoral aims in mind: Opening up the Green Belt to "gentle" tourism without endangering its natural values, increasing its popularity and making the formerly fortified border visible and palpable in the landscapes were mentioned along with enhancing political acknowledgement of the Green Belt's value and worthiness for conservation. The Green Belt's becoming a UNESCO World Heritage site was also said to be a goal.

Expert-led excursions for children and adults alike were suggested to increase public awareness. More generally, cooperation with tourism and regional development was suggested as a way to enlarge political, economic and public interest.

Furthermore, reinforcement of public relations for the Green Belt was mentioned as an important issue. In regard of projects and activities, the topic's full potential needs to be tapped and activities should therefore focus not only on one side of the border but on both. Scepticism towards neighbouring countries and fear of the Green Belt's becoming another border could be overcome that way.

All of these objectives are, however, not commonly agreed on by all parties involved in the initiative. One National Park's representative felt that the initiative did not communicate any common aim to the outside. Another interviewee added that more clearly defined goals and conservation measures would help to overcome scepticism arising due to fear of calls for more protected areas in the Green Belt region.

In Germany, there is a very concrete general aim: To turn the Green Belt into a continuous network of open land. Habitats related to open land have become rare in the surrounding landscapes, and the former border strip had been kept open for decades by the time the Iron

Curtain was lifted. Conserving this state of the landscapes has become the overarching aim for the German Green Belt initiative.

The question about whether there is a common, overarching aim for the Central European Green Belt turned out negative. Interviewees could only name goals they thought important: establishment of a continuous biotope network along and across the Green Belt, conservation of diversity, exchange of know-how between conservationists, prevention of further fragmentation, conservation of natural and cultural landscapes and historical heritage. Usage of the common European history and natural heritage to popularise nature conservation, cooperation of conservation and regional development in the border regions and enhancement of the Green Belt's visibility and palpability in the landscape were also listed.

When asked to name target biotopes for conservation in the Austrian Green Belt, interviewees mentioned riverine landscapes and floodplains (e.g. along Morava (*March*), Dyje (*Thaya*), Mura (*Mur*) and Lafnitz), bogs and mires and fine-grained traditional cultural landscapes. Alpine landscapes were named for Carinthia, wet meadows for Upper Austria, wet biotopes, dry grasslands and saline lakes for the Burgenland. Again, there are no commonly defined target biotopes.

One interviewee said that corridor biotopes in general were important and that the Green Belt was suitable as a corridor for migrating wildlife despite its habitat diversity, provided it was wide enough. They emphasized that it was the only existing transnational corridor and should definitely be used for establishment of migration routes. Another interviewee thought that the Green Belt could not function as a habitat network for individual species because its very distinct landscapes would not permit their migration. They even suggested that the idea of a wildlife migration corridor was wrongly communicated to the public and said that people should rather use the term "biotope network" when speaking of the Green Belt. They agreed, however, that the concept "Green Belt" could be used to enhance the general "permeability" of agricultural landscapes.

As a basis for the development of guiding concepts, spatially comprehensive and regularly updated **data on species and habitats** in the Green Belt regions is crucial. Austrian interviewees said that the mapping data at hand was mostly limited to certain animal and plant taxa and individual sites or regions. There are also floristic mappings and updated data for project sites. However, the situation differs largely between federal states. One

interviewee thought that the available data was still sufficient for focussing conservation efforts in the Green Belt.

In Germany, up-to-date biotope mappings are available for the entire Green Belt (Geidezis et al. 2014b). From these, spatially comprehensive and explicit **guiding concepts** were formed (Geidezis et al. 2014a). Other associations and government agencies were involved in this process and the resulting guiding concepts and suggestions for biotope management are now binding for all federal states owning land in the German Green Belt. The implementation of these concepts is furthermore documented and discussed in regular meetings by representatives of government agencies and NGOs.

In contrast, there are no spatially comprehensive guiding concepts for the Austrian Green Belt. There are, however, explicit guiding concepts for protected areas (Natura 2000 sites and national parks) and further concepts developed during projects, mostly by ALNC. The only common concept-like document based on systematically collected data was said to have been created between 2006 and 2008 during the Interreg IIIB project GreenBelt ("Gap Analysis of the Central European Green Belt", Schlumprecht et al. 2008). However, none of these guiding concepts are legally binding or have been implemented in state legislation or regional planning. Where applied their outcome is not monitored.

It was also investigated whether representatives thought that guiding concepts and suggestions for management of biotopes in the German Green Belt could be applied to the Austrian Green Belt as well. Some said that they could be used in Austria, at least for open land biotopes. Others disagreed and raised concerns regarding different ownership situations in the (former) border regions of both countries and different effects of the border on various sectors. One ALNC representative thought that the application of German guiding concepts and management suggestions was unnecessary and that regionally adapted conservation measures should rather be added to already existing guiding concepts in the Austrian Agri-Environmental Programme (ÖPUL).

Interviewees were furthermore asked to judge how important guiding concepts, their coordination and implementation were for nature conservation in the Austrian Green Belt. All agreed that they were very important and said that they could be highly beneficial if they were properly implemented, contained concrete goals including specifications of target species and habitats and were kept up-to-date. One National Park's representative added that topic-

specific networking (e.g. for bird migration) among European Green Belt sites and across sectors would be most effective in this regard.

The German interviewee added that monitoring the guiding concepts' implementation was crucial for effective conservation work. Without this supervision a lot less would be achieved in the German Green Belt, as was presently the case in Austria. She also emphasized that scientific results, coordinated strategies etc. were essential as arguments for the safeguarding of valuable areas. One ALNC representative agreed that increasing the knowledge of species occurring in the Green Belt was very important.

When asked to describe **challenges related to guiding concept development, coordination and implementation**, interviewees said that the Austrian Green Belt's missing legal protection lead to a lack of pressure on the government, which in turn made implementation of guiding concepts very difficult. Coordination of concepts is hindered by the absence of a national nature conservation act. Lack of integrated guiding concepts (e.g. consideration of both species and their habitats), conflicts between nature conservation and agricultural sectors and generally low political interest in project results were named as further challenges. One interviewee suggested that staff for improved nation-wide coordination and implementation of guiding concepts was necessary.

Another issue to be considered when developing guiding concepts is linking protected areas to their surroundings. Without such integrative concepts, designation of further protected areas seemed useless to one of the National Parks' representatives. One ALNC representative also emphasized that ecological networking was urgently necessary in the large gaps between protected areas, e.g. in Lower Austria.

Furthermore, some interviewees suggested that historical and cultural components be included in guiding concepts. They said that the Green Belt could be used for inter-cultural encounters and exchange, that nature and culture should be interlinked in these regions and that buildings and structures associated with the Iron Curtain needed to be maintained in order to conserve European historical and cultural heritage.

4.2 Spatial Analysis of the Lower Austrian Green Belt

4.2.1 Cultural Landscape Classes

Six **Cultural Landscape Classes** with characteristic compositions of cultural landscape types after Schmitzberger et al. (2003) were distinguished. For the list of occurring types see Appendix (Table 10, page 128). The most dominant type(s) as well as other mixed in types are listed for each Class. The numbers of municipalities belonging to each Class are given in parentheses at the end of the respective Class-descriptions. For a list of municipalities in each Class see Appendix (Table 9, page 123).

- Class A: Large-scale arable land, heterogeneous

  Lowlands and hills with a large-scale coarse-grained matrix of arable land, interspersed with fine-grained complexes of (vineyards), arable land, grassland and many small, isolated biotope patches as well as remnant forest patches.

  Large areas are used for grain farming (type 403 (44% to 93% of municipal agricultural area), mixed in or co-dominant type 404 (0-43%), once 405 (9%)). Pannonian viticulture and crop farming complexes (type 603 (0-36%)) and large forest areas (types 202 (0-29%), 205 (0-17%)) also appear. Sporadically, forests along large rivers (type 203) and (dry) grasslands and pastures (types 307, 311) can be found. (n_A= 28)

- Class B: Large-scale arable land, homogeneous

  Lowlands and hills with a matrix of large-scale coarse-grained arable land with very few landscape elements, in parts interspersed with (alluvial) forest patches, (riparian) grassland corridors and fine-grained complexes of arable land.

  Grain farming landscapes are dominant (type 404 (22-93%), mixed in or co-dominant 403 (0-39%)) but in some municipalities alluvial forests take up large areas (type 203 (0-44%)). Grassland (type 307 (0-34%)), large forest areas (type 202 (0-33%), sporadically 205 (0-8%)) and complexes of viticulture and crop farming (type 603 (0-13%)) occur in some municipalities. Small towns and suburban areas (type 705) and urban agglomerates (type 702) maximally take up 15% of the municipal area but are much smaller in most municipalities. Steep hillsides are used for viticulture (type 602)

in large areas of two municipalities (Prottes: 17%, Angern an der March: 27%). (n_B = 26)

- Class C: Small-scale arable land and vineyard complexes

  Lowlands and hills with fine-grained complexes of (grassland), vineyards and arable land and many small biotope patches and corridors, in parts interspersed with coarse-grained arable land and (alluvial) forest patches.

  A mixture of crop farming, viticulture and/or grain farming (types 603 (5-87%), 602 (0-32%), 404 (0-53%) and 403 (0-44%)) is characteristic. Large forest areas (types 205 (0-55%), 202 (0-27%), once 203 (30%), 204 (13%)) appear in some municipalities. One municipality features a large dry grassland area (type 311 in Berg: 9%). (n_C = 16)

- Class D: Woodland clearings with arable land and mixed-use complexes

  Woodland clearings with a matrix of intensive arable land and remnants of the traditional cultural landscape (extensively used pastures and meadows, orchards, fine-grained arable land), in parts interspersed with (ravine) forest patches and riparian grassland corridors.

  In this Class, crop farming is dominant (types 405 (35-83%), 408 (0-25%)). Two municipalities also feature grain farming areas (type 403 in Hardegg: 3%, Geras: 24%). Grassland (type 307 (1-6%)) and large forests (patches and/or corridors, types 204 (0-38%), 205 (0-22%), 202 (0-12%)) are mixed in in all municipalities. (n_D = 8)

- Class E: Small-scale arable land and grassland complexes

  Highlands with a fine-grained, heterogeneous matrix of arable land and grassland with a dense network of small biotopes, in parts interspersed with (ravine) forest patches of different extent and riparian grassland corridors.

  Crop farming is very dominant in this Class (type 408 (40-66%), 405 (0-22%)). Large forest areas and/or forest corridors in valleys and gorges (types 202 (4-33%), 204 (0-17%), 205 (0-13%)) and grassland (types 307 (5-12%)), 308 (0-19%) also occur in all municipalities. (n_E = 9)

- Class F: Large-scale forests and grassland

  Highlands with a matrix of large-scale forests and (intensive) grassland, in parts interspersed with complexes of structure-rich arable land and bogs and mires, small biotope patches, riparian grassland corridors and remnant forest patches.

  Grassland and forest are the dominant land cover types (types 205 (0-55%), 308 (0-49%), 307 (2-20%), 202 (0-19%), 204 (0-11%)). Crop farming is mixed in in most municipalities (type 408 (0-30%)). Settlements (type 705) are mostly small, taking up 2% of municipal areas at maximum, with only two municipalities featuring larger urban areas (Hoheneich: 6%, Gmünd: 10%). (n_F = 20)

Two larger **groups of Cultural Landscape Classes** can be distinguished (Figure 1, page 46). Classes A-C appear in the eastern Lower Austrian Green Belt, which is part of Lower Austria's north-eastern quarter "Weinviertel". On the other hand, Classes D-F are restricted to the western part of the Green Belt, which belongs to the "Waldviertel". The municipality of Weitersfeld forms an exception because it is geographically located in the Waldviertel region but belongs to Class A (Large-scale arable land, heterogeneous). For the sake of simplicity it is therefore treated as Weinviertel municipality in this study.

Classes of the Waldviertel are generally smaller, the largest being Class F (Large-scale forests and grassland) with n_F = 20. In total, 37 municipalities can be considered part of the Green Belt in this quarter. Nearly twice the number of municipalities are part of the Weinviertel (n_{WeiV} = 70). Although the Green Belt municipalities south of the Danube river are officially part of another Lower Austrian quarter ("Industrieviertel"), their cultural landscapes show similarities to those of the Weinviertel.

Classes D, E and F cover rather coherent regions with two separate sub-regions at maximum, while Classes A, B and C show a broader distribution across the Lower Austrian Green Belt. Both Classes A and C appear in five distinct, discontiguous locations and Class B features four unconnected sub-regions.

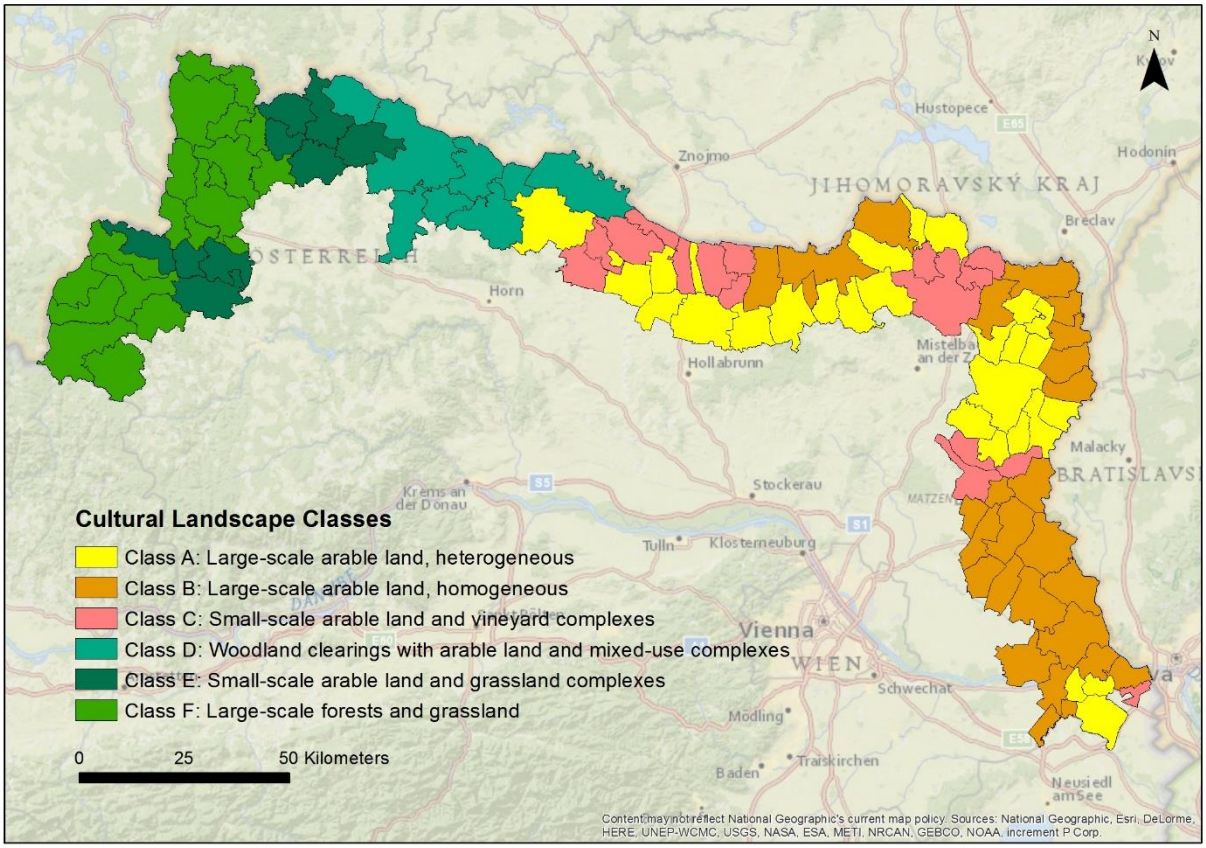

Figure 1: Cultural Landscape Classes in the Lower Austrian Green Belt

Generally, the study area's western part (**Waldviertel**) appears more uniform regarding landform and land-use on a large scale. A matrix of arable land used for crop farming, grassland and large proportions of forest can be found throughout the Waldviertel Green Belt. However, cultural landscapes are generally quite heterogeneous there, often featuring remnants of traditional small-scale land use structures (e.g. extensive pastures and meadows, fine-grained arable land with dense networks of hedges and field margins) and (semi-) natural biotope patches and corridors (e.g. bogs and mires, ravine and alluvial forests, riparian grasslands). Overall, the Waldviertel appears quite "homogeneously heterogeneous".

On the other hand, the Cultural Landscape Classes' characteristics and spatial distribution draw a rather diverse picture of the **Weinviertel**. Classes A (Large-scale arable land, heterogeneous) and B (Large-scale arable land, homogeneous), both strongly dominated by large-scale intensive grain farming, constitute by far the largest part of the Green Belt in this quarter. Landscape elements valuable for nature conservation occur in varying densities, sometimes as structuring elements in finer-grained complexes of arable land, vineyards and grassland, sometimes as corridors of alluvial forests and riparian grasslands or remnant patches of other biotope types. Class C (Small-scale arable land and vineyard complexes) is

generally more strongly structured by landscape elements, the agricultural matrix is fine-grained, smaller scaled and more heterogeneous. In contrast to the Waldviertel, the Weinviertel's landscapes are, however, not generally heterogeneous but rather homogeneous with mixed-in heterogeneous landscape parts.

The regions' difference in heterogeneity is also apparent in the mean **number of cultural landscape types per municipality** (T). The Classes A, B and C, i.e. those of the Weinviertel, feature a grand mean of $\bar{T}_{WeiV} = 4.6$ different cultural landscape types per municipality ($\bar{T}_A = 4.4$, $\bar{T}_B = 4.5$, $\bar{T}_C = 4.8$). In comparison, these values are higher for the Waldviertel Classes ($\bar{T}_D = 6.3$, $\bar{T}_E = 5.7$, $\bar{T}_F = 5.7$), with a grand mean of $\bar{T}_{WaV} = 5.9$. Thus, the Waldviertel's municipalities are, on average, more heterogeneous than the Weinviertel's.

The abovementioned numbers include all cultural landscape types present in the municipalities, regardless of the municipal areas' proportion they take up. Recalculating the means considering only types that take up more than 10% of municipal areas ($\bar{T}_{(>0.1)}$), the difference between Classes is diminished: The mean number of types per municipality amounts to $\bar{T}_{WeiV(>0.1)} = 2.6$ for the Weinviertel ($\bar{T}_{A(>0.1)} = 2.5$, $\bar{T}_{B(>0.1)} = 2.2$, $\bar{T}_{C(>0.1)} = 2.9$) and $\bar{T}_{WaV(>0.1)} = 3.0$ for the Waldviertel ($\bar{T}_{D(>0.1)} = 2.7$, $\bar{T}_{E(>0.1)} = 3.3$,$\bar{T}_{F(>0.1)} = 3.1$). Still, the Waldviertel municipalities appear to be more diverse, featuring more balanced mixtures of cultural landscape types and less large uniform landscapes.

Some municipalities appear very different from their surroundings. This might, however, be due to the strictly area-based and necessarily generalizing method, which might have produced **classification artefacts.** Alberndorf im Pulkautal (Class A), for instance, forms an island between the surrounding Class C municipalities. However, looking at aerial photographs, landscape structures and land-use types seem similar in the entire region, and Alberndorf's differing classification is probably due to the municipalities' elongated shape and a resulting altered ratio of cultural landscape types.

4.2.2 Conservation Value

The Conservation Value Index was used to evaluate Lower Austrian Green Belt municipalities in regard of concentration of landscape elements and biotopes valuable for nature conservation (Figure 2, page 48). For a list of municipalities' Conservation Values and more detailed maps see Appendix (Table 9, page 123 and Figures 8-10, pages 117-119).

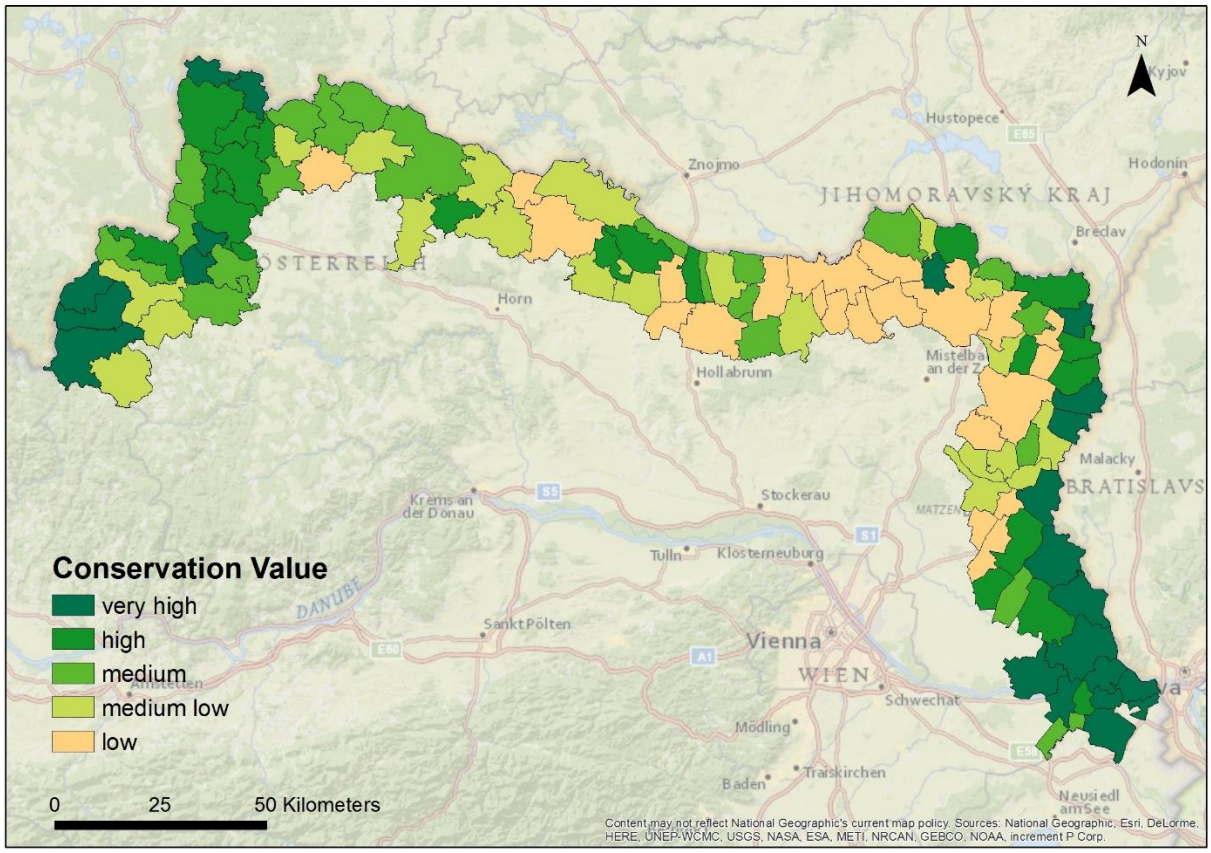

Figure 2: Lower Austrian Green Belts' Conservation Value

As with the Cultural Landscape Classes, larger **regions of similar Conservation Value** can be distinguished. Two large clusters of rather high Conservation Value in the Lower Austrian Green Belt's very west and (south-) east contrast with a patch of quite low index values in the north-east.

The **Waldviertel** municipalities feature higher mean Conservation Value than those of the northern Weinviertel ($\overline{CV}_{WaV} = 0.033$, $\overline{CV}_{nWeiV} = 0.017$). There is, however, a trend from high to lower Conservation Value towards the Waldviertel's eastern boundary. The western part of the Waldviertel Green Belt shows generally high or very high values with some medium- and only a few medium low-value municipalities. Further east, the mix of medium- to medium low-value landscapes still features hardly any municipalities in the lowest Conservation Value class.

Before reaching the **Weinviertel**, the Lower Austrian Green Belt crosses the Manhartsberg ranges, which constitute the geological border between Wald- and Weinviertel. From there, another complex of valuable landscapes extends eastwards to the margins of the Basin of Laa.

Along the eastern Lower Austrian border, a peak in Conservation Value is caused by the large Danube-Morava-Dyje floodplains complex. A belt of (very) high-value landscapes stretches along the border and is interrupted only in one place by two medium low-value municipalities. While the south of this region features no low-value municipalities at all, further north a large proportion of the hinterland is of low Conservation Value. In this regard, there is a certain similarity between the Morava-Dyje hinterland and the northern Weinviertel landscapes. Especially in the Basin of Laa and its surroundings, cultural landscapes are very poor in landscape elements and feature hardly any natural biotopes.

The various **indicators' influence on Conservation Values of Waldviertel and Weinviertel** municipalities was analysed. It turned out that forest areas, small biotope areas and high-value cultural landscapes constitute the main difference between the regions. In order to facilitate interpretation the indicators' weighting factors were not considered in the analyses described below. Relative importance, on the other hand, is an "inherent" characteristic of each individual site and therefore included in the values stated here.

The mean and median indicator values for municipal forest areas differ strongly between Waldviertel and Weinviertel ($\frac{\bar{F}_{WeiV}}{\bar{F}_{WaV}} \approx 213$). Only two municipalities possess (very small) F areas in the Waldviertel Green Belt ($\bar{F}_{WaV} < 0.001$, $\tilde{F}_{WaV} = 0$), while there is but one Weinviertel municipality without any F areas ($\bar{F}_{WeiV} = 0.04$ and $\tilde{F}_{WeiV} = 0.03$). However, since F areas in the Weinviertel are generally very small compared to other indicator areas, they hardly influence Conservation Values. Also, since they are based on approximate data (see forest area, page 20), their informative value in regard of nature conservation is low. A large part of F areas is constituted by wind protection hedges and tree rows, the value of which is often low for landscapes' biodiversity.

The difference between regions in regard of small biotope areas is also considerable ($\frac{\bar{B}_{S(WeiV)}}{\bar{B}_{S(WaV)}} \approx 17$). Even though the actual mean and median values are very small due to the areas' small sizes, they express a large difference between Waldviertel and Weinviertel: $\bar{B}_{S(WaV)} = 0.0009$ and $\bar{B}_{S(WeiV)} = 0.012$, $\tilde{B}_{S(WaV)} = 0$ and $\tilde{B}_{S(WeiV)} = 0.001$. The numbers of occurring small biotope types give an obvious reason for this: There are many more dry grassland areas than bogs and mires in the Lower Austrian Green Belt. The former are

naturally more common in the dry landscapes of the Weinviertel, which leads to relatively high B_S values for this region.

Municipal large biotope areas were also compared using both mean and median values. While the Weinviertel Green Belt's mean is marginally higher ($\bar{B}_{L(WeiV)} = 0.31$, $\bar{B}_{L(WaV)} = 0.27$), the median value is nearly ten times smaller than the Waldviertel Green Belt's ($\tilde{B}_{L(WeiV)} = 0.008$, $\tilde{B}_{L(WaV)} = 0.06$). This suggests a different distribution of large biotope areas between the regions: In the Weinviertel, the largest part of B_L areas is concentrated on a few municipalities, leaving many without any (semi-) natural biotope areas at all (see also Figure 3, page 51). On the other hand, most Waldviertel municipalities do possess B_L areas, even though their mean size (and relative importance) may be smaller.

The mean indicator values for high-value cultural landscapes are $\overline{CL}_{WeiV} = 0.38$ and $\overline{CL}_{WaV} = 1.53$. Comparison of the medians leads to quite the same results ($\tilde{CL}_{WeiV} = 0.28$, $\tilde{CL}_{WaV} = 1.72$), with a marginally higher proportion of small CL areas in the Weinviertel and more large CL areas in the Waldviertel municipalities.

There is not a single municipality in the Waldviertel Green Belt without at least a small high-value cultural landscape area, while the Weinviertel features five municipalities with no high-value cultural landscapes at all and six more with $CL < 0.01$. The minimum CL value for the Waldviertel is $CL_{min(WaV)} = 0.1$. The maximum values are $CL_{max(WeiV)} = 1.67$ and $CL_{max(WaV)} = 2.11$, again supporting the results obtained by the abovementioned comparisons.

Mean and median values for urban areas and fragmentation do not hint at any considerable difference between Waldviertel and Weinviertel. The means are $\bar{U}_{WaV} = 0.03$ and $\bar{U}_{WeiV} = 0.04$, $\overline{FRAG}_{WaV} = 0.38$ and $\overline{FRAG}_{WeiV} = 0.35$, indicating marginally smaller urban areas and less fragmentation (larger effective mesh size) in the Waldviertel municipalities.

4.2.3 Protection Status

The Protection Status index measures the degree to which (semi-) natural biotope areas (i.e. bogs and mires, dry grasslands, wetlands or floodplains according to the datasets used for calculation of the Conservation Index (see page 21)) are legally protected (Figure 3, page 51).

For a list of municipalities' Protection Status and more detailed maps see Appendix (Table 9, page 123 and Figures 11-13, pages 120-122).

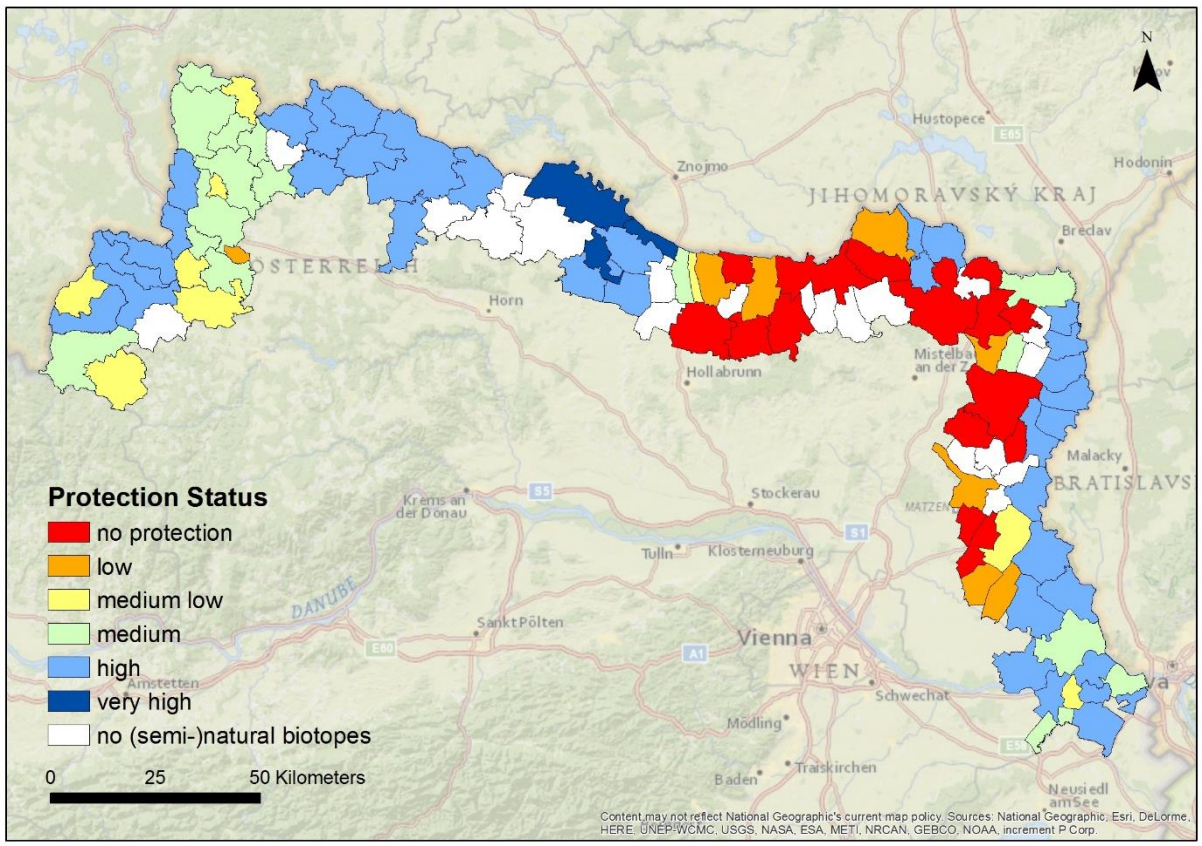

Figure 3: Lower Austrian Green Belt's Protection Status

Regarding the **distribution of Protection Status values**, one very conspicuous cluster of municipalities with no protected biotopes at all catches the eye. It expands along Lower Austria's north-eastern "corner", including the Morava-Dyje region's hinterland and several municipalities of the northern Weinviertel. This latter region generally shows of strikingly low level of legal protection, with hardly any municipalities of medium or high Protection Status. Most of the few dry grassland patches and small floodplain and wetland areas, such as wet meadows, alluvial forest patches and small streams, are completely unprotected. A large part of the remaining municipalities in this area do not possess any valuable (semi-) natural biotopes at all.

On the other hand, the Danube-Morava-Dyje floodplains region is quite well protected, with high Protection Status in large parts and only a few medium municipalities. Medium low Protection Status only occurs once in this area (Bad Deutsch-Altenburg) and is due to a large wetland area, partly unprotected and partly with low-level protection.

Similarly to the large river landscapes of the east, the Waldviertel's network of streams and ponds is quite well protected. The medium Protection Status of many western Waldviertel municipalities is due to a rather low level of legal protection. The large Ramsar site "Waldviertel ponds, peat bogs and floodplains" and Natura 2000 sites of the area cover most biotopes. There is, however, a rather large number of municipalities that possess unprotected (semi-) natural biotopes.

Finally, a cluster of high and very high Protection Status is located around the Thayatal National Park in the municipality of Hardegg. In total, (semi-) natural biotopes of only three municipalities (Hardegg, Retzbach and Schrattenthal) are covered to a large extent by high-level protected areas.

The proportion of protected biotope areas per municipality and the average level of their legal protection both affect municipalities' Protection Status. These **factors' influence on the Protection Status values** are different between regions. Municipalities without any protection and/or (semi-) natural biotopes were ignored in the following analyses.

While the mean level of protection $\overline{LP}_{WaV} = 6.05$ for the Waldviertel, the Weinviertel's is $\overline{LP}_{WeiV} = 7.15$. The median values differ similarly, with $\tilde{LP}_{WaV} = 6.18$ and $\tilde{LP}_{WeiV} = 7.48$. In comparison to the Weinviertel, these numbers show an average lower legal protection level of the Waldviertel's biotopes. Furthermore, the Weinviertel seems to feature more municipalities of rather high Protection Status than the Waldviertel. On the other hand, the maximum municipal Protection Status occurs in the Waldviertel Green Belt ($LP_{Hardegg} = 9.98$).

Contrastingly, the average proportion of protected biotopes is larger in the Waldviertel than in the Weinviertel ($\overline{PPB}_{WaV} = 0.92$, $\overline{PPB}_{WeiV} = 0.55$). The minimum value among the Waldviertel's municipalities is $PPB_{Hirschbach} = 0.3$, indicating that there are no municipalities without any protected biotopes at all. Comparison of the median values shows that there are also more municipalities with very large proportions of protected biotopes in the Waldviertel ($\tilde{PPB}_{WaV} = 0.96$, $\tilde{PPB}_{WeiV} = 0.83$). The latter number hints at a polarized distribution of Protection Status values across the Weinviertel's municipalities: While most of them feature large proportions of protected biotopes, some are under no protection at all.

4.2.4 Cultural Landscape Classes, Conservation Value and Protection Status

The following tables show the distribution of Conservation Value (Table 4) and Protection Status (Table 5), i.e. the number of municipalities in each class, across Cultural Landscape Classes.

Table 4: Number of municipalities per Cultural Landscape Class and Conservation Value class (The highest values for each Cultural Landscape Class are indicated in bold print.)

Conservation Value	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland	**sum**
very high	3	**10**	2	0	1	**6**	22
high	3	6	3	1	1	**7**	21
medium	4	3	**4**	**2**	**4**	4	21
medium low	**6**	0	**6**	**4**	**2**	3	21
low	**12**	**7**	1	1	1	0	22
sum	28	26	16	8	9	20	107

Table 5: Number of municipalities per Cultural Landscape Class and Protection Status class (The highest values for each Cultural Landscape Class are indicated in bold print.)

Protection Status	**Class A** Large- scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** large-scale forests and grassland	**sum**
very high	3	1	2	1	0	0	7
high	4	**10**	**4**	**4**	**5**	**6**	33
medium	1	4	1	0	1	**8**	15
medium low	2	1	0	0	**2**	4	9
low	1	4	2	0	0	1	8
no protection	**8**	4	3	0	0	0	15
no (semi-) natural biotopes	**9**	2	**4**	**3**	1	1	20
sum	28	26	16	8	9	20	107

In most Classes either a tendency towards one Conservation Value / Protection Status group or towards two very different groups can be observed. An example for the former case is Conservation Value of Class A (Large-scale arable land, heterogeneous), which is low or medium low in 18 out of 28 municipalities. Divergent tendencies can be observed in Class B (Large-scale arable land, homogeneous): While 10 municipalities feature very high Conservation Value, 7 obtained a low result (n_B = 26).

The distribution of values across Classes is a key information for the development of common guiding concepts and will be referred to again in the Conclusions section.

4.2.5 Conservation Value, mean distance from border and mean altitude

A statistical analysis of the relationships between Conservation Value and these other factors was conducted using the software R 3.1.2.

At first glance, the relationship between **Conservation Value and mean distance from the border** seems consistent across the Lower Austrian Green Belt. For the entire area as well as for the two separate regions similar effects show in the boxplots (Figure 4). The relationships were tested at a 5% significance level.

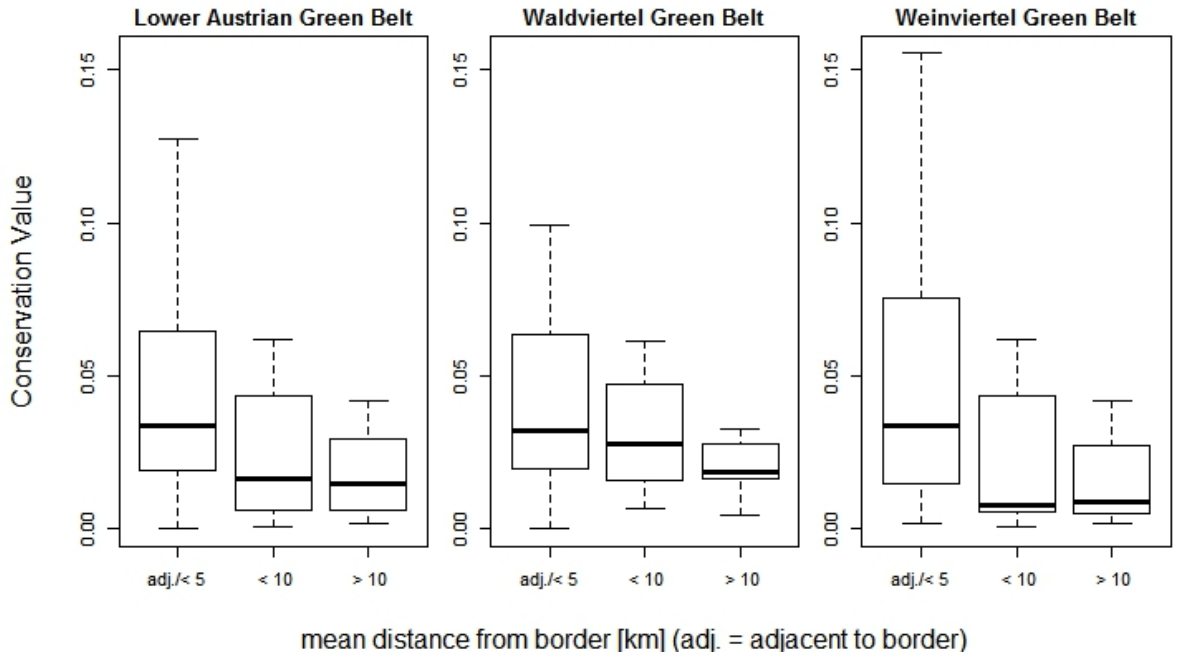

Figure 4: Conservation Value and mean distance from border (Outliers are not drawn in order to improve the visibility of the relationship).

Conservation Value is significantly affected by mean distance from the border in the entire Lower Austrian (Kruskal-Wallis *H*-test, χ^2 = 13.08, d.f. =2, P < 0.01) and the Weinviertel Green

Belt (Kruskal-Wallis *H*-test, $\chi^2 = 9.23$, d.f. = 2, P < 0.01). No significant effect could be found in the Waldviertel (Kruskal-Wallis *H*-test, $\chi^2 = 5.19$, d.f. = 2, P = 0.07). The boxplot shows, however, that the group medians decrease slightly with increasing distance (Figure 4, page 54).

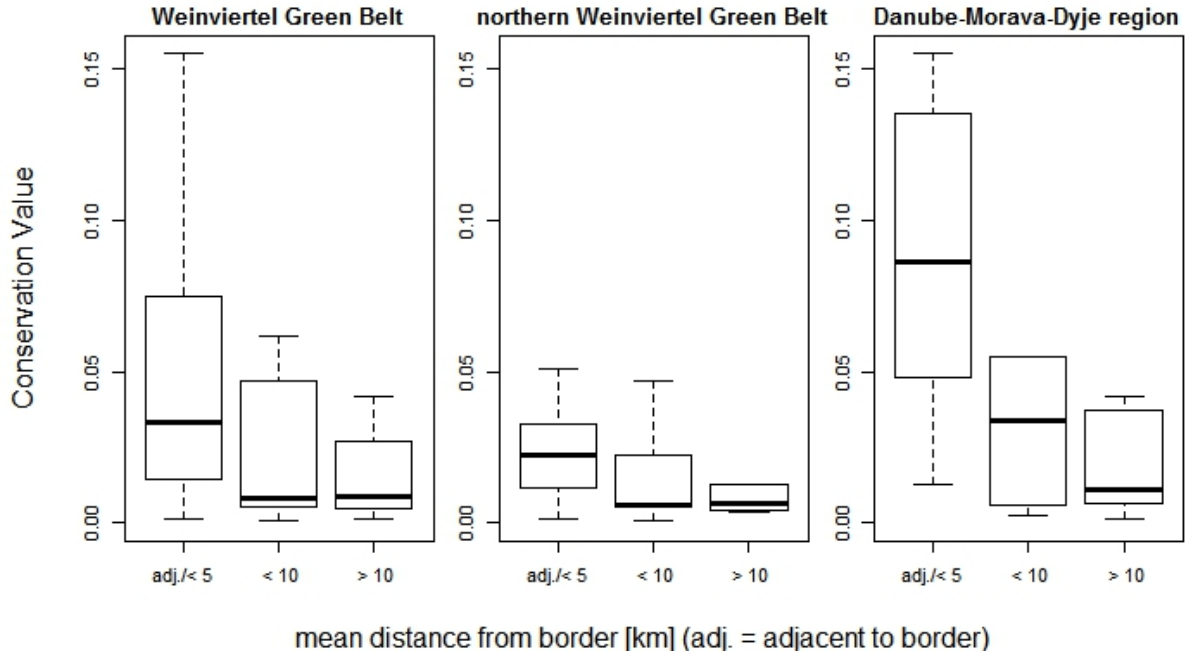

Figure 5: Conservation Value and mean distance from the border in the Weinviertel Green Belt and its parts (Outliers are not drawn in order to improve the visibility of the relationship).

The Weinviertels' highly significant result is mainly due to the very valuable Danube-Morava-Dyje floodplains that stretch along the entire eastern border of Lower Austria (Figure 5, cf. Figure 2, page 48). However, there is also a number of small floodplain and wetland areas and dry grassland patches in vicinity to the Weinviertel's northern and north-eastern border, which increase Conservation Values there as well. Kruskal-Wallis *H*-tests showed that distance has a significant effect on Conservation Value in the Danube-Morava-Dyje region ($\chi^2 = 9.57$, d.f. = 2, P < 0.01), whereas no such relationship could be found for the northern Weinviertel Green Belt ($\chi^2 = 3.67$, d.f. = 2, P = 0.16). The different distance groups' medians are, however, considerably different in this latter region as well (Figure 5).

The Waldviertel Green Belt's valuable biotopes, in contrast, are no denser in close proximity to the border than elsewhere. This might be due to a large number of streams and related biotopes that traverse the entire region. Still, many of them do flow directly along the border, for instance the rivers Dyje (*Thaya*) in the municipality of Hardegg and Lužnice (*Lainsitz*) in the surroundings of Gmünd.

Pairwise comparisons between mean distance groups proved that, considering the entire Lower Austrian Green Belt, there is a significant difference only between the most distant groups A (adjacent/ dist. < 5km) and C (dist. > 10km) (Mann-Whitney *U*-test, W = 1013, n = 77, P < 0.01). The same is true for the Weinviertel (Mann-Whitney *U*-test, W = 408, n = 48, P = 0.02). Regarding the entire Lower Austrian Green Belt, comparisons between A and B (dist. ≤ 10km) (Mann-Whitney *U*-test, W = 971, n = 79, P = 0.05) and B and C (Mann-Whitney *U*-test, W = 463, n = 58, P = 1) led to no significant results. In the Waldviertel, no significant differences between any groups could be found (for groups A and C: Mann-Whitney *U*-test, W = 137, n = 29, P = 0.08).

The relationship between **Conservation Value and mean altitude** was also statistically tested. For the entire Lower Austrian Green Belt mean altitude was found to have a signifant effect on Conservation Value (Kruskal-Wallis *H*-test, χ^2= 15.33, d.f. = 4, P < 0.01). Pairwise comparisons between mean altitude groups showed that there is a significant difference in Conservation Value only between municipalities with mean altitudes of 200-300 and 500-700 m.a.s.l. (*U*-test, W = 212, n = 58, P = 0.01). No significant difference could be found between municipalities of different altitudes in the Weinviertel region (Kruskal-Wallis *H*-test, χ^2 = 5.64, d.f. = 2, P = 0.06). On the other hand, there is a significant effect of altitude on Conservation Value in the Waldviertel Green Belt (Kruskal-Wallis *H*-test, x^2 = 7.39, d.f. = 2, P = 0.02). However, it can be assumed that altitude effects are influenced by distance from the border as well, and since they are not relevant for the research questions treated in this study, as explained in the Concepts and Methods section (page 29), further investigations on this topic were renounced.

4.3 Expert interviews

Please **note** that the following is a compilation of information obtained during expert interviews. The results stated here reflect the interviewees' answers to the questionnaire (see Appendix, page 133) as well as further comments and have not been verified. Exceptions are statements with indicated sources.

4.3.1 The Green Belt region

Interviewees were asked to explain what they thought about the **Green Belt as a concept** and as a spatially separate region.

They attached great symbolic value and a large potential to attract both public and media attention to the Green Belt idea in general. More particularly, the Green Belt was said to represent the diversity of Lower Austria's natural landscapes in an exemplary way and to make history visible through them. Interviewees also felt that it provided a great opportunity to make contact with neighbouring countries by way of nature conservation. One interviewee thought that the Green Belt concept could serve as a springboard for conservation measures and efforts if enough work was put into it.

One person emphasized that the Green Belt should be preserved by wise use of its landscapes, e.g. by nature-friendly agriculture and forestry, rather than by strict legal protection. In this regard, the open-mindedness of local people, especially farmers, was a big issue that needed consideration. Also, the Green Belt should become more present in state administration, for instance in relation to ecosystem services, such as water regeneration.

In regard of treatment of the **Green Belt as a spatially separate region**, integrating natural and cultural landscapes within its limits but set apart from the hinterland, interviewees had different opinions. Many said that, considering natural features in the border regions, the Green Belt could be treated separately in nature conservation. It was called a European green corridor with a real connecting function between many European regions and climatic zones, serving e.g. as a migration route for a multitude of species. Also, it features refuges for nature and wildlife due to less intensive land use and fewer anthropogenic disturbances compared to the hinterland in the past and present. The Iron Curtain's influence helped to conserve large, relatively undisturbed natural areas all along its former extent, which now are a common Green Belt characteristic. All these factors were mentioned as reasons for the Green Belt's special situation and interviewees felt that they justified treating it as a separate region in nature conservation. Some emphasized, however, that it had to be considered a transnational region and that "the other side" of the border must not be ignored. Protected areas in the vicinity of the border should also be connected to the Green Belt and considered part of the Green Belt region. One interviewee said that its delimitation ought to depend on project goals as well as target biotopes and species. The latter were mentioned as an example

for the necessity of transnational thinking because they, of course, do not heed political borders and use landscapes on either side. Deterioration or conservation of habitats therefore affect populations across borders.

Apart from the borderlands' natural features, there are other issues directly and indirectly connected to nature conservation that justify speaking of the Green Belt as a special region. Two interviewees mentioned special conservation requirements and approaches in the Green Belt region: The need for transnational projects and activities and the focus on protection of areas on an international level made the borderlands special. Conservation of valuable remnant areas along the border is, on one hand, per se highly important and could, on the other hand, provide a starting point for further measures beyond the limits of the Green Belt. One interviewee was concerned, however, about the many different categories of protected areas, regional conservation approaches etc. currently applied to the Green Belt and said that these might have already led to a sort of "administrational fragmentation". They thought that the region should rather be seen as one interlinked area, which, if disturbed, is affected in its entirety.

Economically, many regions all along the former Iron Curtain are underdeveloped and structurally lagging. Tourism within the framework of the Green Belt was mentioned as a factor that could connect them and, again, made a common Green Belt region seem beneficial. One interviewee emphasized that people in the border lands lived in a completely different situation and had a much closer relation to the Green Belt than those from the hinterland. Another one said that common history and natural features as well as the sheer size of the European Green Belt called for it to be seen as a special zone. They added that this would also allow for consideration of the Green Belt in the context of other border regions, such as the Korean De-Militarized Zone.

Last but not least, one interviewee said that the Green Belt deserved much more attention, even though or just because it was not implemented in any nature conservation legislation.

Objections to the Green Belt's treatment as one interlinked zone were due to its heterogeneous natural landscapes, ecosystems and biotopes, which made some interviewees feel that it was a rather theoretical construct and hardly useful in applied nature conservation. Also, two interviewees said that boundaries between border regions and hinterland were fluid in regard of natural features and did not allow delimitation of a Green Belt region. One person

found it necessary to implement nature conservation on a large scale and as spatially comprehensive as possible and did therefore not think that separating the Green Belt region from the hinterland was reasonable. Another one said that trying to integrate the surroundings of protected areas, such as the Morava-Dyje floodplains, into conservation efforts made things very complicated. They thought it very difficult to reconcile the Green Belt's different natural and cultural landscapes and people with one another, even more so the larger the region was. Municipalities were thought to have very different goals and ambitions too, which further complicated their integration into one common framework. Therefore, an interlinked, contiguous Green Belt zone along the border might not be practicable.

Interviewees were furthermore asked to explain what they thought about the development of **guiding concepts specially for the Green Belt region** and without consideration of the hinterland. One interviewee said that a general, large-scale guiding concept for all Green Belt regions was useful and important. Again, the fact that the Lower Austrian Green Belt represents many Lower Austrian landscapes (i.e. highlands of the "Waldviertel" and lowlands of the Vienna Basin as well as "Weinviertel" and "Marchfeld") and their characteristic sets of species was mentioned as a great potential for their protection and safeguarding within the Green Belt framework. One interviewee said that the Green Belt featured a number of characteristic biotopes (e.g. large river landscapes, deciduous forests) that occurred in many places along its course, and that common guiding concepts were therefore useful for the border lands. Another one said that guiding concepts were only practicable if formed for specific biotopes characteristic of a border region (e.g. "Sutten" (temporary water bodies) in the surroundings of the municipality of Laa an der Thaya).

Another approach thought of was to develop guiding concepts or visions for the border regions in a first step and then extend their implementation beyond the regions' limits. This might be useful also in regard of public and media attention. Generally, guiding concepts could be a way of drawing attention to the border regions and focussing conservation efforts on them.

Several interviewees said that guiding concepts had to extend across borders in order to be useful. They felt that it was beneficial to focus on the border lands on a transnational level and thus ensure the cross-boundary protection of valuable areas, such as the Morava-Dyje

floodplains. Also, one person thought that guiding concepts on a local scale were essential for large-scale safeguarding of the Green Belt. They said that such local guiding concepts had to be coordinated in order to implement biotope networks and corridors and that far too often, uncoordinated local concepts hindered the success of a large-scale conservation plan.

However, a number of arguments against the development of guiding concepts specially for the Green Belt region were also brought up. One interviewee thought that guiding concepts should be limited to small spaces relatively homogeneous regarding natural features and could not be extended across larger, heterogeneous landscapes. In contrast to this, another one said that guiding concepts had to be formed for large areas and that their limitation to individual sites or small areas could never allow for effective protection of species or biotopes. They emphasized that isolation of populations was a fundamental problem in nature conservation and could only be overcome by spatially comprehensive and integrative concepts and measures. One person saw no difference between borderland and hinterland biotopes and preferred common guiding concepts for biotope types rather than for border regions. Another suggested approach was to develop general guiding concepts for larger regions, integrating border lands and hinterland, and include the Green Belt as a special feature.

One interviewee said that the common history of the Green Belt regions had to be integrated in guiding concepts in order to make them useful and justifiable. Another one emphasized the importance of integrating local people.

Some people said that established administrational structures, such as LEADER regions and regional associations should not be ignored. They might provide useful bases and contact points for conservation efforts and development of the Green Belt. Municipalities' acceptance of conservation actions could also increase if measures were integrated in the LEADER framework, for instance.

4.3.2 Guiding concepts

A map of Cultural Landscape Classes in the Lower Austrian Green Belt (see Appendix, Figure 6 and 7, pages 115-116) was presented to the interviewees, who were asked about their thoughts regarding the landscapes' classification and the usefulness of Class-specific common guiding concepts.

Overall, most interviewees found the **delimitation of Cultural Landscape Classes** comprehensible. Some found it quite generalized but still thought it was applicable. One person pointed out that transition zones between Classes existed and must be kept in mind. When it came to guiding concept development, however, some interviewees had suggestions for improvement of the classification. While several persons had no difficulties imagining common guiding concepts for the Classes given, others suggested different approaches to the topic. Two general procedures could be applied:

One suggested option is to generalize the classification even more and work with only two or three regions (e.g. Weinviertel (Classes A-C) and Waldviertel (Classes D-F) or Waldviertel, northern Weinviertel and eastern Weinviertel (Danube-Morava-Dyje region)). This approach would have to include very basic guiding concepts suitable for quite different cultural landscapes. One interviewee said that if special natural features such as specific biotopes and species or landscape configuration were not considered in the classification, neighbouring Classes could not be distinguished from one another and necessarily had to be merged for a more generalized classification. As an example, the landscape of Prellenkirchen (Class A: Large-scale arable land, heterogeneous) and the surroundings of Schlosshof (municipality of Engelhartstetten, Class B: Large-scale arable land, homogeneous), which could be given similar guiding concepts, were mentioned. Also, some interviewees felt that there was no big difference between the municipalities of Classes A and B in the Morava region.

The second option is to differentiate more strongly, which implies focussing on differences in natural features, biotope types and landscape configuration. One interviewee said that these factors were not congruent with the Cultural Landscape Classes and the classification was therefore not useful for guiding concept development.

Interviewees were furthermore asked about the **usefulness of common guiding concepts for each Cultural Landscape Class**, i.e. a single common concept for all municipalities belonging to one Class. While some interviewees were convinced that such concepts were practicable and useful, others had doubts. The fact that specific valuable areas (e.g. the Morava-Dyje floodplains) and biotope types (e.g. bogs and mires) were not considered for the classification of cultural landscapes at hand and that, subsequently, guiding concepts for the Classes would not be primarily focussed on such special features, caused concern. Some interviewees thought that guiding concepts had to be tailored to individual biotope types

across the expanse of the Green Belt (or even beyond it) rather than to large heterogeneous regions. Others suggested that concepts rather be developed for specific valuable areas and not be extended beyond their limits. On the other hand, some interviewees said that the protection of such special areas or biotope types did not impede the application of common guiding concepts for the Classes. Irrespective of these sites' special protection and/or management requirements, the cultural landscapes surrounding them could still be subject to guiding concepts applied on a larger scale.

The Classes' heterogeneity in regard of natural features as well as cultural and socioeconomic aspects was another reason for concern. One interviewee said it would be difficult to develop guiding concepts for large regions when even within municipalities various types of soil and different landforms could be found. Another one gave an example of two groups of neighbouring municipalities that would not cooperate due to "traditional" rivalries and animosity.

Generally, many interviewees emphasized that guiding concepts' scopes of application, executing institutions or groups of stakeholders and the targets they are meant to achieve were interdependent and must be harmonized.

The interviewees' concrete **suggestions for components of guiding concepts** are listed in Table 6 (page 63). Some interviewees described their visions for the landscapes, defining a target state for them and providing "ready-to-use" guiding concept components. Others had difficulties imagining landscapes' target states. One interviewee said that the current negative development of land use and landscape configuration, namely the loss of fine-grained cultural landscapes and structure-richness in Lower Austrian landscapes, made imagining an "ideal" state for them very difficult. In general, the pragmatic focus on prevention of further damage to and measures for restoration of valuable biotopes, i.e. on very concrete targets, obviously kept many interviewees from thinking of an idealistic and perhaps infeasible guiding concept. Thus, they rather named characteristic areas of conflict, biotopes and species that have become rare or are currently threatened and measures necessary for their conservation. From these, guiding concept components had to be derived by description of the target state these measures are meant to achieve.

Table 6: Guiding concept components per Cultural Landscape Class

	Class A Large-scale arable land, heterogeneous	**Class B** Large-scale arable land, homogeneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
conservation approach	restoration approach, conservation of typical landscape character with contrasting landscape elements	restoration approach, conservation of typical landscape character with contrasting landscape elements	focus on richness of landscape elements	focus on cultural landscapes' potential for nature, differentiation between river valleys and surroundings	focus on natural features, conservation of ecological functions (e.g. flood protection)	focus on natural features, conservation of ecological functions (e.g. flood protection)
landscape configuration and elements	agricultural landscape interspersed with wetland areas and small loess bluffs and field margins as habitats of characteristic species, connected to and pervaded by alluvial corridors	agricultural landscape pervaded by a network of 2-3 m wide field margins, small island biotopes (e.g. small loess bluffs as habitats of characteristic species) and larger biotope areas between plots (dry grasslands, riparian and floodplain corridors, remnants of wet biotopes (e.g. reed patches on sites with high groundwater levels))	landscape rich in diverse landscape elements (small loess bluffs, cherry trees, hollow ways etc.)	structure-rich complexes of arable land with a rather dense network of hedgerows and copses[1] (e.g. protruding from forests) or (terraced) field margins, natural riparian corridors[2] (linking forests and open land), interspersed with bogs and mires and small biotopes, landscapes generally more open than in Classes E and F, with open pine or mixed forest[3], open grassland and meadows along small headwaters, interlinked dry, nutrient-poor and wet	structure-rich complexes of arable land interspersed with bogs and mires and small biotopes	complexes of woodland and grassland with integrated structure-rich complexes of arable land, interspersed with bogs and mires, riparian grassland corridors, nutrient-poor biotopes (e.g. Nardetum communities), granite boulders and ridges and other small biotopes

Table 6: Guiding concept components per Cultural Landscape Class

	Class A Large-scale arable land, heterogeneous	**Class B** Large-scale arable land, homogeneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
land use	middle sized plots, small proportion of maize fields, large proportion of fruit or vegetable crops with diverse crop rotation, wisely distributed fallows, improved structure of agricultural matrix	decreased plot sizes, nature-friendly farming practices that allow for stepping stones in the network of biotopes, improved structure of agricultural matrix, increased species diversity in the entire landscape (not only in isolated biotope areas)	typical fine-grained wine-growing landscapes, forest islands used as coppice with standards (*Mittelwald*), decreased plot size in lowlands	low-intensity agriculture and forestry, reduced plot sizes with sufficient landscape elements (increased structure-richness and diversity), conserved remaining meadows, increased forest naturalness and proportion of broadleaf trees	near-natural forest structure, conserved landscape elements, well-balanced ratio of land use types, high quality of agriculturally used areas (esp. marginal land, no drainages, abandonment, forestation, conversion of grassland to arable land)	near-natural forest structure (reduced proportion of spruce (*Picea abies*) monocultures), conserved landscape elements, well-balanced ratio of land use types, high quality of agriculturally used areas (esp. marginal land, no drainages, abandonment, forestation, conversion of grassland to arable land), focus on development of forests and meadows
management of (semi-) natural biotopes		increase of floodplain dynamics, restoration of river landscape with space for Morava and Dyje without river regulations			focus on waterways, ponds, bogs, mires and wetlands	focus on waterways, ponds, bogs, mires and wetlands

Table 6: Guiding concept components per Cultural Landscape Class

	Class A Large-scale arable land, heterogeneous	**Class B** Large-scale arable land, homogeneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
general	general approximation to the most valuable landscapes of the Weinviertel region (Class C)	general approximation to the most valuable landscapes of the Weinviertel region (Class C)		general approximation to the state of Class F	general approximation to the state of Class F	

[1] hedges and copses of varying densities, e.g. with old, decaying (fruit) trees, hawthorn (*Crataegus spp.*), wild roses (*Rosa spp.*), blackthorn (*Prunus spinosa*)
[2] natural riparian corridors with alder (*Alnus spp.*), willows (*Salix spp.*) etc.
[3] open pine (*Pinus sylvestris*) or mixed forest (pine, spruce (*Picea abies*), oak (*Quercus spp.*) and other broadleaf species) with rich shrub understorey (e.g. thorn bushes)

A number of **additional suggestions for parts of Classes or regions combining several Classes** are listed below:

Danube-Morava-Dyje region (Classes A, B and C):

Guiding concepts should integrate cultural landscapes and not only focus on floodplains. Nonetheless, riparian forests should be target biotopes. Fallows and field margins are important landscape elements and can offer potential for nature in cultural landscapes. The general aim is a protected near-natural lowland river landscape with close-to-natural inundation patterns.

North-western Weinviertel (Classes A, C and D, approximately between Hardegg and Weitersfeld in the west and Mailberg, Seefeld-Kadolz and Wullersdorf in the east):

In cultural landscapes dominated by arable land promotion and restoration of landscapes' ecological functions, especially along waterways, should be key components of the guiding concept. Increased land use sustainability and conservation of fine-grained traditional complexes of arable land (and vineyards) with many hedges in hilly parts and field margins in flat parts, dry grassland areas, (Oak) forests and riparian (floodplain) corridors is important.

Southern part of Class F (surroundings of Langschlag):

The vision includes a fine-grained strip field landscape typical for this region interspersed with bogs, mires and forests, i.e. a pre-industrialization landscape pattern. Flower-rich terraced field margins and granite boulders in the forests are important features.

Northern part of Class F:

Less open land with no strip fields and a larger proportion of forests than in the southern part of the Class are typical for this region. The target state is a mixture of near-natural landscapes, interspersed with bogs and mires etc., and low-intensity cultural landscape (e.g. with ponds).

Surroundings of Laa an der Thaya (Basin of Laa, Classes A and B):

An important component of the guiding concept for this region should be the protection of "Sutten". Drainage of these temporary water bodies must be prevented. Generally, a restoration approach should be chosen and applied e.g. to the Dyje (*Thaya*) corridor.

Municipality of Petronell-Carnuntum (Class B):

In consideration of the remarkable archaeological excavations in this municipality, the land surrounding them should not be agriculturally used. The reinstallation of a corridor of dry grasslands and woodland along the *Limes pannonicus* is part of the vision.

Furthermore, interviewees were shown a map of the Lower Austrian Green Belt municipalities' Conservation Value (see Appendix, Figure 8-10, pages 117-119). Referring to this map they were asked for their opinion on the **usefulness of the Conservation Value index in regard of a further differentiation of guiding concepts**. As on the differentiation of guiding concepts according to Cultural Landscape Classes, opinions were different. To some interviewees the Conservation Value index seemed comprehensible and very useful. They thought it was a good means to further classify municipalities and choose the most effective conservation approach for them. One person said that is was essential to adapt guiding concepts according to Conservation Value because they must be tuned to specific local situations. They did not believe that common guiding concepts for Cultural Landscape Classes could work without such individual adjustments.

Some interviewees, on the other hand, agreed that adaptions were necessary but did not consider the Conservation Value index the right approach. The generalization on municipal level was one point of concern. People suggested that for adjustment of common guiding concepts to the needs of particular municipalities valuable sites had to be analysed individually and concepts should be tailored accordingly. Others would rather differentiate Class-specific guiding concepts with regard to the occurrence of specific biotope types, i.e. woodland or open agricultural landscapes, and develop common concepts for those.

In contrast, some said that larger regions including municipalities of high and low Conservation Value, different biotope types and cultural landscapes could constitute valuable habitats for some species, e.g. birds of prey that needed diverse landscapes to meet both their hunting and breeding requirements. Separate guiding concepts for each landscape or biotope type could, in this case, not tap the regions' full potential.

One interviewee recommended the consideration of municipalities' demographic development as another factor for classification, since regions suffering from rural depopulation could provide special opportunities for nature conservation.

Another interviewee said they would rather not differentiate Class-specific guiding concepts at all. They did suggest emphasizing special valuable biotopes in individual municipalities but would still use a common guiding concept for them. In this regard, the Conservation Value index could best be used in a general way to set priorities for nature conservation.

One person suggested that the Conservation Value index might be useful for balancing regional economy: Cooperation between several municipalities of different Conservation Value could facilitate sensible zoning. The construction of wind power plants, industrial areas etc. might then be constricted to areas of low Conservation Value, while high-value landscapes could be reserved for nature conservation and nature-friendly land use. While all municipalities could benefit from the economic development, nature conservation might also be more easily implemented. Not all municipalities would need to promote economic growth and development on their own territory, thus literally making space for nature.

Thinking about the **implementation of guiding concepts on municipal level** interviewees generally recommended a pragmatic approach. Some said that municipalities should be presented with comprehensible and rather easily realizable guiding concepts. Classification should not lead to too many different concepts. In this regard, the multitude of different protected area categories was mentioned as well. Some interviewees thought that the Green Belt could make good use of Ramsar and Natura 2000 sites as contact and starting points for conservation measures. However, too many different concepts and conservation approaches could confuse municipalities. Reconciliation of the Green Belt with protected areas of different categories might therefore be beneficial.

One person said that municipalities had little or no influence on the development of cultural landscapes and might therefore not be able to implement guiding concepts for these areas. Some suggested that all municipalities should be given the same guiding concept to facilitate cooperation among the ones willing to take action. In a second step, those that were interested could then be provided with a more detailed, adjusted guiding concept. On the other hand, one interviewee suggested that special guiding concepts for groups of municipalities could be incentives for increased cooperation. In any case, rivalries and animosities between municipalities had to be kept in mind.

The possible function of high-value municipalities as best-practice examples for those of lower Conservation Value was controversially discussed. Some interviewees said that the former

could serve as “role models” both in regard of their inhabitants’ approach to nature conservation and in regard of their landscapes. By sharing their strategies these municipalities could ease the way for others. However, some interviewees recommended that only municipalities actively involved in nature conservation and implementing measures be used as best-practice examples. They thought that this commitment did not necessarily correlate with high Conservation Value.

Also, high-quality landscapes in municipalities of high Conservation Value could serve as references for the development of other regions. One interviewee thought that people tended to become blind to shortcomings in their environment and often did not even think of small improvements that could easily be implemented. Therefore, such references were very useful. However, it was also said that municipalities could only serve as “role models” for other municipalities of similar ecological background. As an example, municipalities in the Morava-Dyje-region were named: Those of high Conservation Value close to the border could not be used as models for the hinterland because soils were completely different between them. Instead, these latter municipalities were rather similar to those of the northern Weinviertel region. Thus, they should be approximated to the state of high-quality landscapes there (e.g. Nappersdorf-Kammersdorf or Wildendürnbach).

One person thought that “role models” should not be used at all and instead recommended interlinking municipalities and their biotopes so as to promote cooperation. Municipalities or people that wanted to take action should be brought together, so that their achievements could then automatically set good examples for others. In this regard, Conservation Value was secondary.

Regarding actual **adaptions of common guiding concepts according to Conservation Value** most interviewees suggested adjusted approaches rather than generally different guiding concepts. Most agreed that in municipalities of high Conservation Value preservation of the current state was the key objective. Further improvement was to be pursued if possible. Also, identification and overcoming of conservation shortcomings and threats as well as establishment of connections between valuable biotopes were mentioned as goals for these landscapes. Conservation of traditional land use, e.g. pasturing on marginal land, was thought to be essential for maintaining their high quality.

One person thought that guiding concepts had to be especially effective in such high-value municipalities. There, conservationists should, for example, not content themselves with the establishment of fallows or the prevention of tree felling but should rather pursue more ambitious goals like improvement of floodplain dynamics.

In municipalities of low Conservation Value an opposite approach was recommended. Instead of pursuing high-level objectives, measures easy to implement on a large scale should be suggested. This way, improvement of the landscapes' general state could be achieved quickly. Conservation of remaining and establishment of new valuable, structuring landscape elements and biotopes and, thereby, enhancement of ecological functionality should be key objectives.

A number of **general suggestions and thoughts concerning guiding concepts for the Lower Austrian Green Belt** were mentioned by the interviewees as well. In some cases, they go beyond the scope of concrete visions for landscapes or address very general challenges in nature conservation. Even so, they might provide valuable, thought-provoking input.

- extensification of agriculture and forestry, conservation (and restoration) of high-quality landscape elements (flowering field margins, wide hedges with bushes and trees of different heights, ponds, alleys and roadside trees, etc.) and fine-grained structure, conservation of the status quo of landscapes that have not yet been subject to land consolidation, maintenance of quality of landscape elements, increase of naturalness and proportion of broadleaf trees in forests, meadows along waterways and on hillsides
- interlinkage of natural and cultural landscapes (decrease contrast between them), conservation of valuable natural features by special conservation programs, integration of people into nature conservation (people should benefit from conservation programs: appreciation of conservation measures, recreational and touristic use)
- connection between Green Belt regions, finding similarities like species (e.g. migratory birds) or large rivers (Dyje (*Thaya*), Lužnice (*Lainsitz*)) that link regions, focus on such connecting natural features, creation of a long linear biotope corridor (also transnationally)

- consideration of differences between landscapes mainly influenced either by natural features or by agriculture
- differentiation between semi-open and open landscapes (e.g. using characteristic species like the great grey shrike (*Lanius excubitor*) or Montagu's harrier (*Circus pygargus*)) and development of guiding concepts for each type

4.3.3 Indicator and flagship species

Another topic brought up during interviews was the selection of suitable species as indicators for valuable biotopes and landscape configurations and as flagship species for the Green Belt of Lower Austria.

Generally, interviewees agreed that the use of **flagship species** that attracted public and media attention was of great importance. They said that they were much easier to convey to people and found more resonance than more complex topics like biodiversity or special habitats. Thus, it was important to use species that were widely known. One interviewee suggested that therefore, species that occurred in the entire Lower Austrian Green Belt should be selected (e.g. European tree frog (*Hyla arborea*), European ground squirrel (*Spermophilus citellus*), white-tailed sea-eagle (*Heliaeetus albicilla*), white stork (*Ciconia ciconia*)). In any case, a differentiation according to Cultural Landscape Classes was difficult in regard of flagship species.

Some Green Belt regions already use flagship species for public relations purposes, e.g. the European wildcat (*Felis silvestris silvestris*, Thayatal National Park), European pond turtle (*Emys orbicularis*, Danube region) and Danube crested newt (*Triturus dobrogicus*, Danube floodplains and parts of Morava and Dyje floodplains). While one interviewee thought that these could be used in the context of the Green Belt, another one would prefer not to use flagship species characteristic of only one part of the Green Belt, so as to emphasize the Green Belt regions' common natural features.

In several cases, flagship species could also be used as indicator species (e.g. European ground squirrel *(Spermophilus citellus)*, European hamster (*Cricetus cricetus*), European lynx (*Lynx lynx*), white-tailed sea-eagle (*Heliaeetus albicilla*)). Some interviewees, however, mentioned special **criteria for the selection of indicator species** for nature-friendly land use, near-natural landscape configuration and high-value biotopes. One person said that well

researched species were most suitable. Their mobility was also an important factor. Very mobile species like birds of prey (e.g. eastern imperial eagle (*Aquila heliaca*)) could be used as indicators for large regions whereas others were only present in small regions (e.g. sea milkweed (*Glaux maritima*), Tartar bread plant (*Crambe tatarica*)). Thinking of indicator species' habitat requirements one interviewee said that measures taken to fulfil them had to be kept in mind when selecting species. As an example they named birds of prey's nesting and hunting demands that could be met by measures within the framework of the Austrian Agri-Environmental Programme (ÖPUL). One person said that large mammals (e.g. European lynx (*Lynx lynx*)) requiring a lot of space and large-scale migration routes were most suitable as indicator and flagship species for the Green Belt.

In regard of the **differentiation of indicator species according to Cultural Landscape Classes** some interviewees did not see difficulties. They said that it was important, however, to use sets of species for larger regions so as to be able to meet many different conservation objectives. Other interviewees thought that finding species exclusively characteristic of one entire Class was close to impossible. They suggested selecting indicator species for individual biotope types rather than for heterogeneous landscape complexes. Sets of these indicator species could then be used for each Class so as to cover all occurring biotopes. Even so, sets characteristic of only one Class would be difficult to define. Also, indicator species could have conflicting habitat requirements that might be difficult to balance if such sets of species were used for large regions. One interviewee said that indicator species for each municipality rather than for each Class might be easier to find.

One person had doubts if species could be found that were suitable as indicators for large regions but at the same time did not occur everywhere, being more or less indifferent to anthropogenic disturbances. Another one, however, did think that there were suitable species indicating high-value landscapes and occurring in large parts of the Lower Austrian Green Belt, such as the white-tailed sea-eagle (*Heliaeetus albicilla*).

The **indicator and flagship species named for one or more Cultural Landscape Classes** are listed in Table 7 (page 73). There is no distinction between indicator and flagship species because interviewees often did not clearly differentiate between the concepts. Also, many species might be suitable as both indicators and flagships.

Of course, most of these species do not occur in all habitats or municipalities of the Cultural Landscape Classes they were listed for. As mentioned above, most interviewees emphasized that sets of several species were necessary to represent all landscape and biotope types present in one Class. Some interviewees' specifications regarding habitat requirements and regional occurrences for individual species are not given in Table 7. In any case, they will have to be subject to more detailed and comprehensive research on indicator/flagship species suitability.

Also, since the table is solely a compilation of interviewees' suggestions, species might occur in others than the checked Classes as well. They might also be able to migrate and expand their ranges of distribution in the Lower Austrian borderlands if suitable habitats were provided.

Some interviewees mentioned habitat types that could be used as indicators for near-natural landscape configurations and nature-friendly land use. These are listed at the end of Table 7.

Table 7: Indicator and flagship species per Cultural Landscape Class

species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
animals						
arthropods						
Calliptamus italicus (Italienische Schönschrecke)	X		X			
Carabus menetriesi pacholei (Hochmoorlaufkäfer)						X
Conocephalus dorsalis (Kurzflügelige Schwertschrecke)						
large branchiopods ("Urzeitkrebse")	X	X				
Maculinea rebeli (Kreuzenzian-Ameisenbläuling)[1]			X			

Table 7: Indicator and flagship species per Cultural Landscape Class

species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
Mantis religiosa (Europäische Gottesanbeterin)	X		X			
Mecostethus grossus (Sumpfschrecke)				X		
Odonata species (Libellen)						X
Saga pedo (Große Sägeschrecke)	X	X	X			
Satyrium pruni (Pflaumen-Zipfelfalter)				X		
Stenobothrus nigromaculatus (Schwarzfleckiger Heidegrashüpfer)				X		
Stenobothrus stigmaticus (Kleiner Heidegrashüpfer)					X	X
birds						
Aegolius funereus (Rauhfußkauz)[2]					X	X
Alcedo atthis (Eisvogel)						X
Anthus pratensis (Wiesenpieper)					X	X
Aquila heliaca (Kaiseradler)	X	X	X			
Athene noctua (Steinkauz)			X			
Burhinus oedicnemus (Triel)		X				
Ciconia ciconia (Weißstorch)	X	X	X	X	X	X
Ciconia nigra (Schwarzstorch)				X	X	X

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Cinclus cinclus (Wasseramsel)						X
Circus cyaneus (Kornweihe)				X		
Circus pygargus (Wiesenweihe)				X	X	
Crex crex (Wachtelkönig)	X	X		X		
Dryocopos martius (Schwarzspecht)[3]	X					
Emberiza calandra (Grauammer)	X	X	X			
Glaucidium passerinum (Sperlingskauz)[2]					X	X
Heliaeetus albicilla (Seeadler)	X	X	X	X	X	X
Lanius collurio (Neuntöter)			X			
Lanius excubitor (Raubwürger)	X	X	X	X	X	X
Lullula arborea (Heidelerche)	X			X	X	X
Merops apiaster (Europäischer Bienenfresser)	X	X	X			
Milvus migrans (Schwarzmilan)	X	X	X			
Milvus milvus (Rotmilan)	X	X	X			
Perdix perdix (Rebhuhn)	X	X				
Saxicola rubetra (Braunkehlchen)						X
Otis tarda (Großtrappe)[4]	X	X				
Tringa ochropus (Waldwasserläufer)						X

Table 7: Indicator and flagship species per Cultural Landscape Class

species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
Upupa epops (Wiedehopf)	X	X	X			
Vanellus vanellus (Kiebitz)		X				
mammals						
Alces alces (Elch)					X	X
Cervus elaphus (Rothirsch)	X	X				
Cricetus cricetus (Feldhamster)	X	X	X	X	X	X
Felis silvestris silvestris (Wildkatze)				X	X	X
Lepus europaeus (Feldhase)	X					
Lutra lutra (Fischotter)	X	X	X	X	X	X
Lynx lynx (Luchs)					X	X
Spermophilus citellus (Ziesel)	X	X	X	X	X	X
molluscs						
Margaritifera margaritifera (Flussperlmuschel)						X
reptiles & amphibians						
Bombina bombina (Rotbauchunke)	X	X				
Bufo viridis (Wechselkröte)	X					
Emys orbicularis (Europäische Sumpfschildkröte)		X				
Hyla arborea (Europäischer Laubfrosch)	X	X	X	X	X	X

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Lacerta agilis (Zauneidechse)				X		
Lacerta viridis (Smaragdeidechse)				X	X	X
Pelobates fuscus (Knoblauchkröte)	X	X				
Pelophylax spp. (Wasserfrosch)	X	X				
plants						
flowering plants						
Agropyron pectinatum (Steppen-Kammquecke)	X	X	X			
Allium angulosum (Kanten-Lauch)	X	X				
Alopecurus pratensis (Wiesen-Fuchsschwanz)				X	X	X
Armeria elongata (Gewöhnliche Grasnelke)	X	X				
Arnica montana (Echte Arnika)					X	X
Arrhenatherum elatius (Glatthafer)				X	X	X
Artemisia campetris (Feld-Beifuß)	X	X	X			
Carpinus betulus (Hainbuche)	X	X	X			
Clematis integrifolia (Ganzblatt-Waldrebe)	X	X				
Corynephorus canescens (Silbergras)	X	X				
Crambe tatarica (Tataren-Meerkohl)	X	X	X			
Dactylis glomerata (Wiesen-Knäuelgras)				X	X	X

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species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
Eryngium campestre (Feld-Mannstreu)	X	X	X			
Fagus sylvatica (Rotbuche)				X	X	X
Festuca ovina (Schaf-Schwingel)	X	X	X			
Gentiana cruciata (Kreuzenzian)			X			
Gentianella praecox (Böhmischer Enzian)						X
Glaux maritima (Strand-Milchkraut)	X	X	X			
Kochia prostrata (Halbstrauch-Radmelde)	X	X	X			
Koeleria gracilis (Zierliches Schillergras)	X	X	X			
Krascheninnikovia ceratoides (Europäische Hornmelde)	X	X	X			
Jasione montana (Sandknöpfchen)					X	X
Juncus bufonius (Kröten-Binse)	X	X	X			
Leucojum aestivum (Sommerknotenblume)	X	X				
Picea abies (Fichte)						X
Populus alba (Silberpappel)	X	X				
Quercus cerris (Zerreiche)	X	X	X			
Quercus petraea (Traubeneiche)	X	X	X	X	X	X
Quercus robur (Stieleiche)	X	X				

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species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
Ranunculus sceleratus (Gift-Hahnenfuß)	X	X	X			
Rhododendron tomentosum (Sumpfporst)				X	X	X
Salix x rubens (Hochweide)	X	X				
Sanguisorba minor (Kleiner Wiesenknopf)	X	X	X			
Sorbus torminalis (Elsbeere)	X	X	X			
Stipa pennata (Echtes Federgras)	X	X	X			
Stipa capillata (Pfriemengras)	X	X	X			
Trisetum flavescens (Goldhafer)				X	X	X
Urtica dioica (Brennnessel)	X	X				
Vaccinium myrtillus (Heidelbeere)				X	X	X
Vaccinium vitis-idaea (Preiselbeere)				X	X	X
Vitis vinifera (Weinrebe)	X	X	X			
mosses						
Hylocomium splendens (Stockwerkmoos)				X	X	X
Pleurozium schreberi (Rotstängelmoos)				X	X	X
Sphagnum spp.				X	X	X
habitat types						
alluvial meadows (Cnidion dubii)	X	X	X			
alluvial forests	X	X	X			

Table 7: Indicator and flagship species per Cultural Landscape Class

species or habitat type	**Class A** Large-scale arable land, hetero-geneous	**Class B** Large-scale arable land, homo-geneous	**Class C** Small-scale arable land and vineyard complexes	**Class D** Woodland clearings with arable land and mixed-use complexes	**Class E** Small-scale arable land and grassland complexes	**Class F** Large-scale forests and grassland
aquatic plants of streams and rivers (floating communities, e.g. with aquatic *Ranunculus spp*.)				X	X	X
bank vegetation of natural lakes				X	X	X
bogs and mires					X	X
dry and semi-dry grasslands	X	X	X			
Molinion ceruleae					X	X
Nardetum communities					X	X
sand biotopes (dunes)	X	X				
wet meadows					X	X

[1] *Maculinea spp.* are also suitable for several parts of the Waldviertel but are very rare
[2] all owl species are suitable
[3] all woodpecker species are suitable
[4] might be unsuitable due to unsuccessful current conservation efforts

Some interviewees explicitly named **species useful for addressing region-specific fields of conflict or characteristic natural features and landscape elements**:

Weinviertel (Classes A, B, C):

In the Weinviertel (Classes A, B and C) a range of dry biotope types should be considered when selecting indicator/flagship species. For dry grasslands and related arable land with sufficient fallows the European ground squirrel (*Spermophilus citellus),* European hamster (*Cricetus cricetus),* predatory bush cricket (*Saga pedo*)*,* grey partridge (*Perdix perdix*) and corn bunting (*Emberiza calandra*) were named.

In large parts of the Weinviertel landscapes are dominated by **loess.** Typical plant species of the loess steppes are *Festuca ovina, Koeleria gracilis, Stipa pennata, Stipa capilllata,*

Sanguisorba minor, Eryngium campestre, Artemisia campestris and *Agropyron pectinatum.* The latter occurs also in proximity to floodplains, which makes it a connecting element between dry and wet habitats. The Weinviertel landscapes, currently featuring very strong contrasts and abrupt transitions from high- to low-value areas, could benefit from measures for the protection of such connecting species.

On (very) dense soils *Ranunculus sceleratus* and *Juncus bufonius* can be found. In general, the Weinviertel presently features too few **wet biotopes** like ponds and streams, the remaining ones are poorly connected to larger floodplain areas and often in need of restoration. For these habitats the European green toad (*Bufo viridis*), fire-bellied toad (*Bombina bombina*), common spadefoot (*Pelobates fuscus*) and water frogs (*Pelophylax spp.*) as well as characteristic bird and dragonfly species could be used as indicator/flagship species.

Some species are especially suitable indicators for small parts of the Weinviertel or habitats that have become very rare. The so-called "**Weinviertler Klippenzone**", a geologically distinct zone crossing the Weinviertel from north to south, is home to two insect species that might be useful as flagship species: the Italian locust (C*alyptamus italicus*) and the European mantis (*Mantis religiosa*).

In the **surroundings of Matzen-Raggendorf and Mistelbach** (located outside the study area) *Quercus petraea, Quercus cerris, Carpinus betulus* and *Sorbus torminalis* could be used as indicator species. In the municipality of Poysdorf the rare Mountain Alcon Blue (*Maculinea rebeli*) and its host plant *Gentiana cruciata* occur.

A special habitat type occurring in the **Basin of Laa** are the so-called "Sutten". Large branchiopods (*Urzeitkrebse*) and characteristic bird species depend on these temporary water bodies. Some special plant species most worthy of conservation (*Kochia prostrata, Krascheninnikovia ceratoides, Crambe tatarica*) presently occur only in a few Weinviertel municipalities. A characteristic halophilic species growing on salt meadows in the Austrian and Czech part of the region is *Glaux maritima.*

Regarding the **cultural landscapes** of the Weinviertel, several bird species might be suitable as indicators/flagships: the Hoopoe (*Upupa epops*) and the European bee-eater (*Merops apiaster*) for complexes of vineyards with hollow ways, the great grey shrike (*Lanius excubitor*) for fine-grained cultural landscape with sufficient raised hides, meadows, copses, hedges and

alleys and the woodlark (*Lullula arborea*) for nutrient-poor habitats. *Vitis vinifera* was also named as flagship species for wine-growing regions.

According to most interviewees the **Danube-Morava-Dyje floodplains** need special (additional) indicator/flagship species. *Urtica dioica* was named as suitable indicator endangered by invasive alien plant species (*Impatiens glandulifera*, *Solidago canadensis*). *Leucojum aestivum*, *Allium angulosum*, *Clematis integrifolia,* tree species of the alluvial forest (*Quercus robur, Populus alba* and *Salix x rubens*) as well as the European pond turtle (*Emys orbicularis*) and autochthonous red deer (*Cervus elaphus*) were listed. For dry sites and sand dunes within the floodplains *Armeria elongata* and *Corynephorus canescens* could be used.

One important issue in the Danube-Morava-Dyje region is the interlinkage of the large high-value natural biotopes with surrounding cultural landscapes. Several bird species use both habitats for breeding and feeding purposes and could therefore be used as connecting elements: white-tailed sea-egale (*Heliaeetus albicilla*)*,* white stork (*Ciconia ciconia*), corn crake (*Crex crex*), black kite (*Milvus migrans*) and red kite (*Milvus milvus*)*.* The northern lapwing (*Vanellus vanellus*) and the great grey shrike (*Lanius excubitor*) also inhabit high-value cultural landscapes of the region. The great bustard (*Otis tarda*) and the Eurasian stone-curlew (*Burhinus oedicnemus*) only occur in the southern Morava region. The eastern imperial eagle (*Aquila heliaca*), on the other hand, is a species characteristic of the Austrian Green Belt's Pannonian part and inhabits the entire eastern border region of Lower Austria.

Waldviertel (Classes D, E, F):

Large mammals like elk (*Alces alces*) and European lynx (*Lynx lynx*) inhabit the Waldviertel's border regions as well as adjacent parts of the European Green Belt. The area also provides suitable habitat for the European wildcat (*Felis silvestris silvestris*).

Tree species are could be used as indicators for the Waldviertel's **forest** landscapes: *Quercus petraea* in lower*, Fagus sylvatica* and *Picea abies* in higher altitudes. Also, *Sphagnum* mosses might be suitable, since they can be found in bogs and mires as well as on wet sites in forests. *Pleurozium schreberi* and *Hylocomium splendens* grow in forest understoreys. As indicators for soil acidity *Vaccinium myrtillus* and *Vaccinium vitis-idaea* could be useful.

Occurrence of the boreal owl (*Aegolius funereus*) is an indicator for near-natural mountain forests with large proportions of dead wood. Large undisturbed forests can also be home to

the black stork (*Ciconia nigra*). Even on this species, however, agricultural land use has an effect: Depending on water bodies and riparian grassland as feeding habitat, the black stork population is negatively influenced by large-scale land consolidation, increased erosion and agricultural intensification. It is a good example for a species indicating the state of large, diverse landscapes.

Generally, **bogs** are characteristic habitats of the western Waldviertel region and often in dire need of protection and restoration. The ground beetle *Carabus menetriesi pacholei*, for instance, can be found in some well-preserved bogs. The green sand-piper (*Tringa ochropus*) is also characteristic of these habitats. For *Rhododendron tomentosum* the wet, acidic biotopes of the north-western Waldviertel are the only suitable habitats in Austria.

Futhermore, **streams and ponds** are important target biotopes in this region. The green lizard (*Lacerta viridis*) inhabits river valleys of the Waldviertel and could be used as both indicator and flagship species. Species related to the waterbodies themselves are the Freshwater pearl mussel (*Margaritifera margaritifera*), European otter (*Lutra lutra*) and white-tailed sea-eagle (*Heliaeetus albicilla*). The latter, however, seems to be rather indifferent to landscape configuration as long as it encounters traditionally managed, near-natural fish ponds for hunting. Generally, piscivores might be problematic when used as flagship species since their protection causes conflicts between nature conservation and owners of fish ponds as well as sport fishing associations.

Characteristic **cultural landscape** elements of the north-eastern Waldviertel could be covered by special indicator species: the black hairstreak (*Satyrium pruni*) uses copses, the hen harrier (*Circus cyaneus*) hunts in field margins and breeds in open forests. Like, for instance, Montagu's harrier (*Circus pygargus*) it is an indicator for the interlinkage of open and semi-open landscapes and forests. Another ideal indicator for the fine-grained cultural landscapes dominated by woodland clearings (Class D) is the great grey shrike (*Lanius excubitor*). It also functions as an umbrella species for many other plants and animals, e.g. red-backed shrike (*Lanius collurio*), whinchat (*Saxicula rubetra*), sand lizard (*Lacerta agilis*), plants of field margins, etc.

The woodlark (*Lullula arborea*) prefers heterogeneous landscapes with interlinked nutrient-poor **meadows** and copses. The meadow pipit (*Anthus pratensis*) is a very good indicator species for meadows too, as is the corn crake (*Crex crex*). Typical, if not particularly

conservation-relevant plants of the Waldviertel's meadows are *Arrhenaterum elatius, Trisetum flavescens, Alopecurus pratensis* and *Dactylis glomerata.* A variety of orthopterans could be used for different types of meadows: The lesser mottled grasshopper (*Stenobothrus stigmaticus*) lives on nutrient-poor sites, *Mecostethus grossus* and *Conocephalus dorsalis* inhabit wet and temporarily inundated meadows. *Stenobothrus nigromaculatus* prefers dry grasslands and meadows. Isolation of suitable habitats, advancing quickly due to the effects of land consolidation on structure-richness and configuration of cultural landscapes, poses a big threat to these animals.

4.3.4 Conservation measures

Interviewees were asked to list concrete measures necessary to achieve the target states defined beforehand for each Cultural Landscape Class.

Measures necessary in all Cultural Landscape Classes mostly focus on diversity and structure-richness of cultural landscapes on one hand and on management of valuable (semi-) natural biotopes on the other. In cultural landscapes conservation of field margins, continued pasturing or mowing of meadows and increase of the proportion of fallows were named. Generally, promotion of extensive and nature-friendly agriculture and forestry is essential. Regarding (semi-) natural biotopes, management and removal of shrubs from dry grasslands, restoration of bogs and mires and establishment of buffer zones between waterways and intensively used agricultural land are important.

Specific measures for individual Cultural Landscape Classes are listed in Table 8. They address Class-specific problems and special natural features.

Table 8: Measures per Cultural Landscape Class

	cultural landscapes	**(semi-)natural biotopes**
Class A Large-scale arable land, heterogeneous	prevent loss of **fine-grained matrix** structure and/or increase **structure-richness** through establishment of **fallows**, plan and wisely distribute "**areas for biodiversity**"[1] on regional scale	conserve current state and/or ensure long-term management of **dry grasslands**, prevent drainage or filling-in and ensure continued use of "**Sutten**"
Class B Large-scale arable land, homogeneous	establish 2-3 m wide **field margins**, reduce **size of fields**	conserve current state and/or ensure long-term management of **dry grasslands**, conserve and/or restore **small wet biotopes**

Table 8: Measures per Cultural Landscape Class

	cultural landscapes	**(semi-)natural biotopes**
Class C Small-scale arable land and vineyard complexes	conserve current **fine-grained, diverse landscape**, maintain landscape elements (**trees in vineyards, loess ridges**), continue use of forests as **coppice with standards**	conserve large proportion of **dry biotopes**
Class D Woodland clearings with arable land and mixed-use complexes	conserve and/or re-establish **meadows**, establish **fallows**, maintain **hedges, field margins, copses** and **riparian vegetation**	
Class E Small-scale arable land and grassland complexes	reduce pressure on **waterways** exerted by eutrophication, sediment input and stocking with alien fish species, promote **near-natural forest structure** (put mature forest stands out of use, increase proportion of dead wood), conserve and restore **marginal and nutrient-poor sites**, (e.g. Nardetum) through extensification, prevention of drainage and continued use	efficiently conserve and restore **bogs and mires**, map remaining valuable sites and ensure their conservation
Class F Large-scale forests and grassland	conserve (small) **meadows**, reduce pressure on **waterways** exerted by eutrophication, sediment input and stocking with alien fish species, promote **near-natural forest structure** (put mature forest stands out of use, increase proportion of dead wood), conserve and restore **marginal and nutrient-poor sites**, (e.g. Nardetum) through extensification, prevention of drainage and continued use	efficiently conserve and restore **bogs and mires**, map remaining valuable sites and ensure their conservation

[1] "areas for biodiversity" (Biodiversitätsflächen) are measures within the Austrian Agri-Environmental Programme (ÖPUL)

Some **measures necessary in larger regions** should not only be applied to individual Cultural Landscape Classes:

<u>Weinviertel (Classes A, B and C):</u>

A coarse-grained **agricultural matrix** dominates large parts of the Weinviertel. In the north-eastern part of the region, field sizes should be reduced where possible. A larger proportion of forests would be beneficial there as well but is more feasible in hilly areas than in the very intensively used lowlands.

Wet biotopes are a main conservation issue in the Weinviertel region. The network of waterways is in dire need of restoration and quality improvement. Quite a few wet meadows, temporary water bodies ("Sutten"), ponds and streams have been conserved up to the present. Still, it is urgently necessary to re-establish and manage wet biotopes in a way that conforms to conservation objectives, e.g. by restoring small streams and giving them more space in the agricultural landscape matrix. The same is necessary for the Weinviertel's large rivers, e.g. Morava (*March*) and Dyje (*Thaya*). Bank reinforcements should be removed in order to increase river and stream dynamics. If possible, not only linear river widening but re-establishment of larger floodplain and wetland areas along waterways should be pursued. These could decrease the currently very strong contrast between waterways and their surroundings. A transition zone from waterbody to siltation zones, meadows and eventually fields is desirable. However, this may have already become infeasible due to river-bed erosion and subsequent relative decrease of water levels.

Reed (*Phragmites australis*) patches can be found throughout the region on sites with high **groundwater** levels. They provide valuable habitats for many insects and birds, which use them as rather undisturbed feeding and breeding sites, and should therefore be conserved in any case. For halophilic sites (e.g. in the Basin of Laa and the Morava-Dyje floodplains), too, groundwater is an essential factor and should be in the focus of conservation efforts.

Waldviertel (Classes D, E and F):

Bogs, mires and woodlands should be the main target biotopes in this region. The former need effective protection from drainage, afforestation, etc. and should be restored where necessary. Woodland structure should be developed towards a near-natural state.

Granite boulders are characteristic landscape elements in the Waldviertel. Conservation of these rocks and the related small near-natural biotopes should also be ensured.

Furthermore, interviewees were asked whether they found **differentiation of measures according to Conservation Value** necessary. Some thought that such an adjustment was important: One person said that guiding concepts should be the same for all municipalities of a Class regardless of Conservation Value but measures did have to be adapted. Different approaches were necessary in landscapes of different Conservation Value: While low-value municipalities had to focus on restoration of landscape elements, for instance, high-value landscapes should rather be conserved in their current state. One interviewee thought that

the level of measures and the respective conservation objectives had to be adjusted. The higher the Conservation Value of a landscape, the more elaborate and target-oriented the measures should be. While low-value regions benefitted from small, low-level improvements like restoration of small wetland areas, municipalities of very high Conservation Value should try to further increase the value of their biotope areas by high-level measures, such as reconnection of cut-off river meanders.

Some interviewees thought that measures had to be adjusted to biotope types, landscape configuration and relief rather than to general Conservation Value. This differentiation is, however, more important for the measures' implementation than for their definition and is therefore discussed in the section "thoughts and ideas regarding the implementation of measures" (page 89).

Two persons said that measures did generally not have to be adjusted to Conservation Value. One thought that much work had to be put into the Green Belt's conservation in all regions, regardless of Conservation Value, so as to preserve a continuous green corridor. Deterioration of landscapes was a threat to and had to be prevented in all municipalities.

Interviewees were furthermore asked about their thoughts regarding the **importance of the Protection Status for differentiation of measures.**

Some interviewees said that general Class-specific guiding concepts and indicator/ flagship species should stay the same regardless of biotopes' legal protection. On the other hand, measures and their implementation, most agreed, did have to be adjusted, keeping the level and category of legal protection in mind. While one person said that Protection Status was not important for the definition of measures, if those were well defined, another one thought that municipal index values reflected the need for action. Dry biotopes seemed to be generally more weakly protected than wet areas.

One interviewee suggested that for most protected areas useful conservation objectives and measures had already been defined and that these should be made use of. In many areas, unfortunately, objectives were not pursued and measures not implemented to a satisfying extent. Even where biotopes were officially protected, deterioration of their quality was not always prevented. Interviewees felt that, as long as existing protected areas were not effectively managed, designation of new ones was useless. For the Morava-Dyje region, however, legal protection on a large scale was said to be a goal. It would avoid, for instance,

economic disadvantages for individual municipalities. One interviewee thought that a UNESCO MAB biosphere reserve would be most beneficial for the Waldviertel Green Belt, since interlinkage of natural and cultural landscapes, involvement of local people and establishment of a corridor are possible in such a protected area. The military training area Allentsteig (located outside the study area) was named as a suitable core area for this hypothetical biosphere reserve, which could connect the fragmented Natura 2000 sites in the region.

Generally, interviewees disagreed about whether conservation measures should be mainly targeting protected areas or the gaps between them. While one interviewee said that the legal protection status reflected the value of areas, others said that the occurrence of important species or valuable biotopes was often not correlated with legal protection. As examples, the unprotected Basin of Laa as habitat of many birds of prey species (e.g. eastern imperial eagle (*Aquila heliaca*), white-tailed sea-eagle (*Heliaeetus albicilla*), red kite (*Milvus milvus*), saker falcon (*Falco cherrug*)) and unprotected parts of the Danube floodplains in the municipality of Wolfsthal were named. One interviewee mentioned that many species did not benefit from legally protected areas, so that focussing conservation efforts on these was not sufficient.

Another interviewee thought that two fundamentally different approaches had to be distinguished: Conservation efforts could either be focussed on individual areas or an integrative approach could be chosen, targeting entire landscapes and species that inhabited them. The importance of municipalities' Protection Status was thus dependent on the conservation approach. While the former approach was the easier one because areas could be clearly delimitated and responsible contact persons could be found, the latter was probably inevitable for long-term success in biotope and species conservation.

In this regard, one interviewee suggested that the Green Belt could be used as an informal network of protected areas to implement measures on sites lacking legal protection. Contrastingly, it was also said that within the Green Belt framework nature conservation efforts should be focussed on high-value natural biotopes. After all, it was them that made the Green Belt special in the first place.

The following **concrete suggestions for differentiation of measures according to Protection Status** were made:

- high Protection Status: focus on implementation of target-oriented measures, coordinate measures with protected area administrations, monitor achievement of conservation objectives in protected areas
- low Protection Status: use municipalities of high Protection Status as best-practice examples, enforce conservation of valuable biotopes without legal protection, improve landscape structure

One very concrete suggestion concerned the Waldviertel Green Belt, where many municipalities feature medium Protection Status (see Appendix, Figure 11, page 120). The Ramsar site "Waldviertel ponds, peat bogs and floodplains" covers many but not all valuable biotopes in this region. According to one interviewee, the currently unprotected biotopes could easily be included in the protected area. They also said that these municipalities, which were currently undergoing strong demographic changes, could provide important opportunities for nature conservation, since many farmers were on the verge of giving up their farms.

Many interviewees had **thoughts and ideas regarding the implementation of measures**. The Austrian Agri-Environmental Programme (ÖPUL) was mentioned by most of them as an instrument for the implementation of measures in cultural landscapes. Some thought that it provided means to effectively change landscapes on a large scale because it was well-established and well-funded. Existing tools like ÖPUL, "Waldumweltmaßnahmen" (both part of the Austrian rural development programme) and Natura 2000 should be used, even though adaptions and improvement of their effectiveness and funding structure were necessary. For instance, "areas for biodiversity" (*Biodiversitätsflächen,* measures within ÖPUL) could be used to improve landscape structure on a large scale and establish migrating corridors for animal species if planned on a regional scale. However, continuity of management and conservation within the ÖPUL framework needed to be enhanced and deterioration of valuable areas must not be continued to be disregarded.

Other interviewees, however, said that key problems like loss of fine-grained, structure-rich agricultural landscapes could not be solved using instruments like ÖPUL. The current structural change in agriculture (enlargement of farms, decrease of livestock and dairy farming, large

percentage of part-time farmers) caused abandonment and intensification of agricultural areas at the same time, leading to a loss of biodiversity in cultural landscapes that could not be tackled by ÖPUL. Such areas needed to be managed otherwise, for instance by landscape maintenance associations, nature conservation NGOs and local bottom-up initiatives. These should be promoted, supported and, if possible, coordinated.

Land consolidation was mentioned as another major threat to biodiversity in agricultural landscapes. It needed to be conducted with much more consideration of conservation objectives. One interviewee said that the few municipalities that have not yet undergone consolidation need to be prioritized and urgently protected from destructive alteration of their agricultural matrix.

One interviewee said that for biotopes that were not used or managed agriculturally, active protection or management by nature conservation institutions was necessary. In this regard, landscape configuration and relief had to be kept in mind. The more easily landscapes could be used for agriculture, the easier was the management of valuable biotopes, too. The mowing of wet meadows in lowlands, for instance, was quite unelaborate and could easily be done by farmers with suitable machines. For dry biotopes on rocky soils, on the other hand, grazing or manual mowing was necessary. However, these sites were sometimes the only preserved ones, since most valuable sites had already been destroyed in easily manageable landscapes.

Regarding especially valuable areas in need of protection, one interviewee suggested an approach on municipal level. Increasing awareness and generating enthusiasm by working with town councilmen and -women was important. Municipalities needed to know that they possessed valuable areas in order to ensure their protection. Also, making use of the potential of municipal spatial planning for the designation of protected areas could prove to be a useful approach. In border regions, transnational conservation measures should be pursued.

The **influence of the Protection Status on the implementation of measures** was also subject to discussion. One interviewee said that the responsibility for implementation of conservation measures was particularly large in protected areas. Instruments for applied nature conservation were well-established, valuable areas mapped and delimitated, objectives were clear and responsible persons existed in protected areas. Funds for nature conservation projects, such as funds made available through the EU's LIFE programme, were

most easily available for measures in protected areas. All these factors made conservation easier in protected areas than in the gaps between them. One interviewee therefore suggested the implementation of measures be started in protected areas and then extended beyond their limits.

The importance of **raising public awareness** for the Green Belt and its valuable areas was emphasized by many interviewees. One said that the Lower Austrian Green Belt region's development had accelerated since the eastern enlargements of the European Union in 2004 and 2007. Open borders, traffic and tourism had led to new problems but also to new opportunities for the Green Belt's publicity. Awareness-raising for natural biotopes and valuable species, nature's connecting function and the international responsibility for its conservation should be intensified. Best-practice examples should be used to encourage the formation of bottom-up initiatives.

In this regard, one interviewee suggested wandering exhibitions, information boards, events (e.g. "Naturathlon", an outdoor sports event), competitions (e.g. drawing, photography, story-writing) and workshops for schoolchildren. They thought involving schools in nature conservation was a very important approach, which might also gain funding rather easily. Connections to local nature conservation measures and native animal species should be used to reach the children and awaken their interest. Still, the entire European Green Belt and its connecting function should be broached as well.

4.3.5 Suggestions for methodological improvement

Some interviewees had suggestions for improvement of the methodology employed during spatial analyses of the Lower Austrian Green Belt.

Regarding **Cultural Landscape Classes** the following (sometimes contradictory) suggestions were made for reclassification of individual municipalities, splitting of Classes or more detailed classification. Some suggestions were explicitly contradicted by other interviewees, who agreed to the current classification, and are therefore given in square brackets.

- Class A (Large-scale arable land, heterogeneous): [reclassification of Dürnkrut and Jedenspeigen as Class B, Bad Deutsch-Altenburg and Hundsheim as Class B or C], Alberndorf im Pulkautal as Class C, Weitersfeld as Class D

- Class B (Large-scale arable land, homogeneous): no suggestions
- Class C (Small-scale arable land and vineyard complexes): reclassification of Berg as Class B, splitting of the Class (surroundings of Retz/Pulkau (transition zone to crystalline bedrock) and surroundings of Poysdorf (loess and limestone landscape) to be treated separately)
- Class D (Woodland clearings with arable land and mixed-use complexes): separate treatment of the Dyje (*Thaya*) valley
- Class E (Small-scale arable land and grassland complexes): reclassification of the northern municipalities (surroundings of Dobersberg) as Class D and of the southern municipalities (Waldenstein, Großdietmanns, Kirchberg am Walde, Schweiggers) as Class F
- Class F (Large-scale forests and grassland): more detailed classification, e.g. of the surroundings of Litschau (focus on waterways), splitting of the Class (focus on remnants of fine-grained cultural landscapes that only occur in the southern part)
- several Classes: separate treatment of municipalities south of the Danube (Bad Deutsch-Altenburg, Berg, Hundsheim, Prellenkirchen, Rohrau, Wolfsthal, parts of Hainburg and Petronell-Carnuntum), more detailed classification of municipalities in the northern Weinviertel (focus on remnants of fine-grained cultural landscapes), separate treatment of the surroundings of Gmünd (lowlands of Třeboň Basin (*Wittingauer Becken*) and Budějovice Basin (*Budweiser Becken*)) around the river Lužnice (*Lainsitz*), separate treatment of the Pürbach pond region

Some interviewees also gave suggestions for methodological improvement of the **Conservation Value index.** Several said that it did not include enough information (e.g. numbers of endangered species or breeding birds) for differentiation of guiding concepts. One person found that valuable forest areas were not considered to a sufficient degree. Some suggested inclusion of Natura 2000 sites as an indicator variable, while others strongly advised against this.

In regard of the general usefulness of the **Protection Status index**, some interviewees said that biotopes' actual legal protection within a protected area should be considered.

Sometimes, biotopes were located within the limits of a protected area but not listed as protected objects and thus often neither conserved nor managed.

4.4 Exemplary guiding concepts

Bringing the results regarding Cultural Landscape Classes, Conservation Value and Protection Status together and joining them with the suggestions and concerns collected during expert interviews, a rough **draft of common guiding concepts for conservation of the Lower Austrian Green Belt municipalities** could be drawn up. A comprehensive discussion of all guiding concepts for all combinations of Cultural Landscape Class, Conservation Value and Protection Status would, however, go beyond the scope of this text. Therefore, exemplary drafts shall be given: Two situations characteristic of Lower Austrian Green Belt were picked and guiding concept components and recommendations for general conservation approaches suggested during interviews as well as a selection of indicator / flagship species were compiled. These exemplary concepts also comprise concrete visions, i.e. descriptions of the landscapes' desirable state, so as to provide clearly imaginable aims for conservation work.

This procedure of guiding concept development can easily be repeated for all occurring combinations of Cultural Landscape Class, Conservation Value und Protection Status. The relevant data is provided in the Results section (especially pages 63ff., 73ff., 84ff. and page 89).

<u>Example 1: A municipality belonging to Cultural Landscape Class A (Large-scale arable land. heterogeneous) with low Conservation Value and no legal protection of biotope areas</u>

Vision: A heterogeneous agricultural landscape with a matrix of middle-sizes plots, interspersed with traditional small-scale, mixed-use complexes (e.g. viticulture, arable land and grassland). The matrix is pervaded by a sufficiently dense network of wet and dry (semi-) natural biotope patches (e.g. fallows, forest patches, temporary water bodies, reed patches) and linear elements (e.g. hedges, field margins, alluvial corridors) which connect to larger biotope areas.

Measures: Improvement of landscape structure and enhancement of ecological functionality are the main objectives in this situation. Currently, the landscape is dominated by a large-scale

coarse-grained agricultural matrix, mostly consisting of arable land. Here, the configuration of the matrix needs improvement: Plot areas should be reduced to a medium size and a smaller proportion of maize fields in favour of fruit or vegetable crops with diverse crop rotation is desirable. More field margins or hedges (depending on relief) and wisely distributed fallows are needed to increase the overall biodiversity of the landscape and provide habitats to characteristic species.

Here and there smaller-scaled complexes of different land use types occur, for instance mixed viticulture, crop farming and dry grasslands. These areas are of high value for biodiversity and can serve as "role models" in terms of landscape configuration and integration of near-natural habitats in the agricultural matrix. Where marginal land (e.g. dry grassland) is endangered by abandonment, continued management needs to be ensured.

Generally, the typical landscape character of the region should be preserved where it still exists and restored where it has been lost. The focus should be on contrasting wet and dry landscape elements (loess bluffs, wetland areas, alluvial corridors along rivers and streams, temporary water bodies ("Sutten"), (Oak) forest patches). A network of wet biotopes pervading the agricultural matrix and interlinking it with larger floodplains and alluvial forests should be restored.

Indicator / flagship species: In regard of the agricultural matrix' structural improvement the European ground squirrel (*Spermophilus citellus),* the European hamster (*Cricetus cricetus),* the hoopoe (*Upupa epops*) and the European bee-eater (*Merops apiaster*) are useful as indicator species. While the rodents inhabit dry grasslands as well as related arable land, if the proportion of fallows is sufficient, the birds like complexes of vineyards with sufficient landscape elements (e.g. hollow ways). Their popularity among the general public and their occurrence in many parts of the Lower Austrian borderlands turn ground squirrel and hamster into suitable connecting flagship species for the Green Belt.

Much less eye-catching but important as indicators for intact loess steppe communities are *Festuca ovina, Koeleria gracilis, Stipa pennata, Stipa capilllata, Sanguisorba minor, Eryngium campestre, Artemisia campestris* and *Agropyron pectinatum.* As inhabitant of floodplain-related and dry sites alike, the latter might be useful for emphasizing the necessary interlinkage of wet and dry biotopes and their integration with one another. Some birds of prey also use both types of habitats for feeding and breeding and could therefore also be used

as connecting elements (e.g. white-tailed sea-eagle (*Heliaeetus albicilla*), red kite (*Milvus milvus*), saker falcon (*Falco cherrug*)).

For wet biotopes, which are currently too scarce in these landscapes, the European green toad (*Bufo viridis)*, fire-bellied toad (*Bombina bombina*), common spadefoot (*Pelobates fuscus*) and water frogs (*Pelophylax spp.*) are suitable indicator and flagship species.

Generally, conservation measures need to be selected according to the chances of implementation and their effort-benefit ratio. The lacking legal protection makes high-level conservation measures such as, for example, restoration of river dynamics very difficult. Therefore, quick improvement of the landscapes' general state with little effort but well-planned, wisely implemented small measures is the way to go.

Example 2: A municipality belonging to Cultural Landscape Class F (Large-scale forests and grassland) with medium to high Conservation Value and Protection Status

Vision: A landscape dominated by a well-balanced mixture of sensibly managed forests, grasslands of various intensities and structure-rich complexes of arable land. Regardless of land use type, a large amount of natural and semi-natural features such as granite boulders, bogs and mires, ponds and waterways provide habitat to characteristic species.

Measures: The landscape is dominated by a matrix of large forest areas and grassland. The former should generally be managed sensibly in order to promote near-natural structure and reduce the proportion of spruce (*Picea abies*) monocultures. Meadows in danger of being drained, abandoned, forested or converted to arable land need to be preserved. Marginal and nutrient-poor sites (e.g. with Nardetum communities) are in particular danger and must be conserved or restored.

In some parts, fine-grained strip field landscapes with flower-rich terraced field margins and interspersed with bogs, mires and forests occur. These complex, diverse landscapes need to be preserved in their current state. A high quality of agriculturally used areas should generally be ensured, especially in regard of marginal land.

Fish ponds constitute an important, typical element of the cultural landscape and provide habitat to many species if they are sensibly managed. Valuable (semi-) natural biotopes like bogs and mires, waterways and riparian grassland corridors as well as special landscape

elements like granite boulders and ridges in forests and open land need to be preserved in order to provide further habitats for native species. The main task in this landscapes is to protect these natural features, especially waterways, ponds, bogs, mires and wetlands, and to conserve ecological functions like water retention and regeneration.

Indicator / flagship species: Inter alia, large mammals and birds that occur in the region (e.g. elk (*Alces alces*), European lynx (*Lynx lynx*), European wildcat (*Felis silvestris silvestris*), boreal owl (*Aegolius funereus*) and black stork (*Ciconia nigra*)) could be used. They depend in part on near-natural forest biotopes, which are in turn inhabited by tree species useful as indicators as well, e.g. *Quercus petraea* for lower*, Fagus sylvatica* and *Picea abies* for higher altitudes. Especially the black stork, however, also serves as indicator for the state of large, diverse landscapes: Depending on water bodies and riparian grassland as feeding habitat, its population is negatively influenced by large-scale land consolidation, increased erosion and agricultural intensification, even though it inhabits large, undisturbed forests.

Bogs could be represented by the ground beetle *Carabus menetriesi pacholei* and the green sand-piper (*Tringa ochropus*). For streams and ponds, which are important target biotopes in these landscapes as well, the Freshwater pearl mussel (*Margaritifera margaritifera*) might be suitable, especially in regard of the necessary reduction of eutrophication, sediment input and stocking with alien fish species.

5 Conclusions

Three methodologically different work packages contributed to the achievement of this study's objectives. Exploratory interviews, detailed spatial analyses and follow-up expert interviews provided information for the creation of a comprehensive overview of the Austrian Green Belt's status quo in regard of administration, conservation planning and applied conservation work, as well as for the development of suggestions for future progress in these sectors.

5.1 The Austrian Green Belt – current situation and suggestions for the future

During the exploratory interviews several topics were repeatedly brought up and thereby proved to be of great importance to the Austrian Green Belt initiative, both in positive and in negative ways.

Firstly it turned out that, while a number conservation, ecotourism and education activities take place in the Green Belt region, a common "Green Belt concept" is clearly missing. The core of the Austrian Green Belt initiative, i.e. the Austrian League for Nature Conservation's national and state branches, currently hardly coordinate their conservation work in the borderlands. A strong Green Belt brand does not exist in Austria, public and political interest and awareness are low. Protected area administrations are little interested in participation in the Green Belt initiative.

An **institution embodying the Austrian Green Belt**, administrating its conservation in all respects, securing funds and providing an officially responsible contact point for anyone interested or confronted with the Green Belt might be a solution for several of these problems. Whether such an institution should be an NGO-related Green Belt project office, similar to the German BUND Project Office Green Belt, an autonomous organisation or an association of institutions currently involved in the initiative is left open for discussion. In any case, continuous effective conservation work and related administrative, public relations and political work would be greatly furthered if permanent staff and reliable long-term funding could be ensured.

The **common definition of conservation objectives** and their concerted communication to the public would also be facilitated by such an organisation. Currently there are no

commonly agreed-on objectives in regard of conservation and no clear concept for the Green Belt's protection to be communicated to politicians or the public. Low public and political interest, scepticism and reservations about the Green Belt's protection, for instance due to fear of calls for more legally protected areas, ensue. The German Green Belt initiative proves that clear, coordinated strategies for conservation, based on sound scientific work, are essential arguments to be used for the safeguarding of valuable areas (see also Geidezis et al. 2014a). If the Austrian initiative's objectives were clearly defined and unequivocally stated cooperation amongst the initiative's members, external commitments and a positive political attitude towards the Green Belt might be promoted.

As an example for a currently unclearly defined aim the terms "corridor" and "ecological/ biotope network" shall be mentioned. Both are frequently used in respect of the European Green Belt as a whole (e.g. Gepp 2010, Lang 2013, Naturschutzbund Oberösterreich 2013, Kovarovics & Jungmeier 2014). They refer, however, to different concepts or, more precisely put, to different levels of one concept: The term "corridor" is used for a continuous passageway for wildlife migrating between larger habitat areas. Corridors are most often designed for the needs of one or few focal species and are therefore relatively uniform. The term "ecological network", on the other hand, suggests a landscape criss-crossed by interlinked (possibly different) biotopes that increase its overall biodiversity and will, of course, comprise corridors (Pryke & Samways 2015). In everyday language the term "corridor" is often associated with a closed-off space, a sort of passageway that allows longitudinal but prevents transversal movement. The term is therefore rather ill-chosen for the Green Belt, especially with regard to its history as a border and in respect of its current ecological diversity. Even though corridors are an essential part of the biotope network, the usage of the term "corridor" might lead to wrong conceptions of conservation objectives. Seemingly infeasible conservation aims and a loss of credibility among the general public might ensue.

Naturally, a continuous migration corridor for wildlife is one of the Green Belt initiatives' key objectives. Such a corridor might well be part of larger biotope network. In this regard the definition of the Green Belt's width is crucial. Many species cannot move directly along the ecologically heterogeneous border line but might find suitable migration routes if also encouraged to move away from the border. Both "corridor" and "biotope network" are therefore important concepts for the Green Belt. In regard of public relations for the Austrian part, however, great heterogeneity of the region makes the term "biotope network" clearly

more appropriate. It should be carefully considered which concept is communicated to the public.

Generally, **public and political interest** is a key issue for the Green Belt's future. Politicians and officials lack personal connections to the Green Belt initiative. While an increase of political commitment to nature conservation is desirable in general, increasing some persons' specific interest in the Green Belt might be a first step in the right direction. Why not take some town mayor canoeing on the Morava river or cycle around lake Neusiedl with a group of councilmen and -women? Personal experiences are a good way to create lasting impressions that might change people's attitudes (see also Miller 2005). If the Green Belt is to be protected in spite of powerful economic interests and destructive infrastructure development, creative approaches against public and political indifference are needed.

Apart from concretization of the Green Belt idea and awareness-raising the Green Belt also needs to become more visible and palpable in the landscape. If people could see and experience nature and history in the borderlands attention would automatically be drawn to them. The Green Belt is an ideal place to get in contact with "the other side", for trans-national encounters and exchange not only for professional conservationists but for everyone who is interested in our shared natural and cultural heritage. Innovative ideas must not even always be searched for across borders, it is often enough to think beyond one's own professional background and thus encounter new points of view.

Furthermore, **cooperation within the Green Belt framework** is currently little attractive to protected area administrations. Even though there are, for instance, three National Parks in the Austrian Green Belt region, they do not work together within the Green Belt framework. The main reason for this seems to be the lack of advantages associated with such involvement. The National Parks' representatives interviewed in this study all agreed that cooperation was only interesting to them if their institutions' public relations, financing or conservation work benefitted from it. For increased involvement in the Green Belt initiative such benefits must be ensured.

Public relations and financing could be improved by a strong Green Belt brand. Currently, the label "Green Belt" is hardly used because it neither draws public attention to conservation projects nor attracts visitors if used in marketing, i.e. there is no added value associated with it. This is very probably due to the lack of publicity and the unclear definition of both the Green

Belt itself and the conservation objectives related to it. If the Austrian Green Belt became a strong, well-established and registered brand, for instance based on the model of an umbrella brand like “Nationalparks Austria”, this situation might be improved.

Another factor is the currently lacking opportunity for administrational networking among ecologically similar protected areas within the Green Belt initiative. Networking among protected area administrations sharing specific conservation issues, for instance following the “Danubeparks” example, would certainly make cooperation more attractive. Migrating birds were mentioned as a good topic for many protected areas to work on together within the Green Belt framework and benefit from exchange of know-how, common marketing possibilities and improved protection of species.

In regard of **spatially comprehensive conservation planning**, the Austrian Green Belt’s heterogeneity currently also seems to hinder cooperation. There is a wide variety of landscape types, economically underdeveloped regions suffering from depopulation and abandonment stand opposed to emergent industrial areas where land consumption and intensification are progressing rapidly. A multitude of different plant and animal communities live in diverse biotope complexes. Even culturally and geographically close regions like the Waldviertel and the Weinviertel differ considerably. It seems difficult to find a common basis for conservation work that is suitable and applicable to all Austrian Green Belt regions. But let’s look a little closer: Diversity per se is no hindrance for cooperation and coordination of conservation work. Quite the contrary is the case: The Green Belt’s heterogeneity is the basis and, at the same time, the aim of common efforts. And even though the borderlands seem to have little in common at first glance, there is a number of natural features, for instance special biotope types and endangered species, and conflict fields like balancing agricultural land use and nature conservation or infrastructure development and fragmentation of habitats, that appear repeatedly all over the Austrian (and the European) Green Belt. These are equally relevant in many places and might serve as starting points for cooperation and coordination, which are certainly beneficial, if not necessary, for the borderlands due to their particular history and special current situation.

In regard of **future opportunities** for the Green Belt’s development and integration into a pan-European “green network”, the European Union’s current “Green Infrastructure” initiatives, inter alia, should certainly be considered. The European Green Belt definitely

complies with the idea of a “network of high-quality green and blue spaces” (Coordination Group of the European Green Belt Initiative / BUND 2015e) and was even listed as an EU-level Green Infrastructure project in the European Commission’s Communication on Green Infrastructure (2013).

5.2 Conservation planning – recommendations for the development of guiding concepts

Before delving into the multitude of aspects related to the Green Belt’s systematic protection, there is one simple question to be answered: **Does the Green Belt exist?** Does Lower Austria actually possess particularly valuable landscapes in proximity to the former Iron Curtain?

The distribution of Conservation Value in regard of distance from the border proves that the Iron Curtain’s preserving effects are still visible in the borderlands. Especially the Danube-Morava-Dyje floodplains along the eastern border of Lower Austria are indisputably among the most valuable biotopes in this region (see also Strohmeier & Egger 2010). Compared to the hinterland they feature far higher Conservation Values. A similar distribution can also be observed in the northern Weinviertel (see also Pfundner 2014). The landscapes of the Basin of Laa form the only large gap in the otherwise rather continuous network of valuable landscapes along the entire Lower Austrian border.

In regard of the Waldviertel Green Belt no significant decrease of Conservation Value with distance from the border could be proved. There is, however, some evidence for an existing relationship, even if only a weak one. The Green Belt might well be wider than 10 km in this part, so that extension of the study area and analysis of a wider corridor would be interesting and might still lead to significant results. So far, this study’s outcomes have shown that there actually is some concentration of valuable landscapes in the Lower Austrian borderlands. This begs the next question: What is this concentration made of? **What does the Green Belt look like?**

Spatial analysis demonstrated, above all, that the borderlands are very diverse in many respects. The Green Belt is very heterogeneous in regard of configuration, diversity and ecological value of cultural landscapes, in respect of richness in (semi-) natural biotopes and the species that inhabit them and also concerning the biotopes’ current legal protection.

Within the study area delimited for spatial analyses two main regions can be distinguished: Waldviertel and Weinviertel differ considerably in their characteristic mix of cultural landscapes and in the distributions of Conservation Value and Protection Status.

The Weinviertel is more strongly dominated by large-scale, intensively used arable land, while the Waldviertel features complexes of forests and grasslands in large parts. Vine-growing landscape also take up a considerable part of the Weinviertel Green Belt, as do complexes of arable land and grassland or arable land and forest in the Waldviertel. These differences must be kept in mind when guiding concepts are developed and a basis for cooperation is wanted. It is a well-known fact that the north-western and the north-eastern quarter of Lower Austria differ in landscape configuration. Due to different climate, geology and, subsequently, historic and current land use they call for different approaches in nature conservation. The specific biotope types occurring in Waldviertel and Weinviertel, respectively, must of course be taken account of as well.

Not surprisingly, general richness in landscape elements and small biotopes is variable in both regions. Remnant patches of traditional cultural landscapes, i.e. fine-grained complexes of various land use types with high densities of small (semi-) natural biotopes and valuable landscape elements occur in the Waldviertel and the Weinviertel Green Belt alike and could serve as "role models" for nature-friendly land use in the respective regions. An integrative approach accounting for both region-specific cultural landscapes and different biotope types is necessary.

In short, the Lower Austrian Green Belt consists of a mixture of large cultural landscapes, many small, isolated (semi-) natural biotopes and a handful of larger biotope areas. It is very diverse, even fragmented by intensive land use in some parts. **So how can it function as an ecological network?**

Spatial analyses and expert interviews proved that cultural landscapes are a vital part of the Lower Austrian Green Belt. Therefore, they urgently need to be integrated into the Green Belt idea, conservation planning and applied conservation work in the borderlands. Cultural landscapes constitute the matrix between individual, often small and isolated (semi-) natural biotope areas that make the Green Belt so valuable. If these are to be preserved in their current state, not to mention linked together in a continuous network of

habitats for a variety of species, cultural landscapes cannot be ignored (see also Opdam et al. 2003).

The classification of cultural landscapes in the Lower Austrian Green Belt delivered six groups of municipalities that feature a similar characteristic mixture of landscapes. They have a common basis for conservation planning and face similar challenges related to nature-friendly agriculture and forestry, to protection of species and their habitats and to preservation of characteristic landscape elements and biotopes.

Building on these Cultural Landscape Classes each municipality's Conservation Value provides information about the most suitable conservation approach. While landscapes of high Conservation Value require effective protection of their valuable, often cross-regionally or even (inter)nationally important biotopes, a restoration-based approach is the right choice for areas of lower Conservation Value. Of course, landscapes are not uniform and sometimes require differentiated measures to do them justice. Still, the Conservation Value index provides a basic means to adjust the general focus to each municipality's predominant conservation requirements.

The third and maybe most concrete indicator developed in this study is the Protection Status index. Its distribution clearly shows that large parts of the Lower Austrian Green Belt currently lack sufficient legal protection. While the Danube-Morava-Dyje floodplains and the surroundings of the Thayatal National Park and the Manhartsberg ranges are well-protected, there is still a large number of valuable but currently unprotected natural landscapes and biotopes in other parts of the borderlands. Especially the Weinviertel region features many small, vulnerable biotope areas embedded in often intensively used agricultural landscapes. The Waldviertel, on the other hand, is largely covered by rather low-level protected areas. Even so, not all valuable biotopes in the region are presently safeguarded. Their integration into a Ramsar or Natura 2000 site should be a conservation objective.

Generally, the ongoing designation process of Natura 2000 sites in Austria (Umweltdachverband 2013, Umweltdachverband 2015) might provide a good opportunity to further investigate the Green Belt's unprotected sites' conservation relevance and the feasibility of their designation as protected areas. A list of areas proposed for designation within the Natura 2000 framework was published by Umweltdachverband in 2012 and shows clearly that many relevant species and habitat types occur in the Lower Austrian borderlands.

A factor to be considered in regard of legal protection, however, is its actual effect on species and habitats. The methodology employed in this study does not allow differentiation between actually protected biotope types and species, i.e. those the protected areas were installed for, and those "coincidentally" occurring in the area. It is therefore possible that biotopes indicated as "legally protected" in this study are in reality not explicitly protected by law. On the other hand, even explicit legal protection does not ensure management and preservation of biotopes or the long-term survival of populations. The Protection Status index must therefore be seen as another means to choose the most effective conservation approach and adjust it to the preconditions set by existing protected areas.

Another question is of vital importance to the development of guiding concepts that effectively enhance cooperation between stakeholders and further conservation of the Lower Austrian borderlands: **How can the Green Belt be subdivided for conservation planning?**

First of all, it must be said that treatment of the Lower Austrian Green Belt as a special zone would certainly be beneficial for its conservation and development. Future conservation planning documents could and should consider the borderlands a region of special conservation requirements, challenges and opportunities. While many general conservation issues certainly apply to all Lower Austrian regions, the Green Belt calls for adapted approaches in some respects, which should be accounted for in conservation planning.

In regard of the borderlands' further subdivision a multitude of different opinions were collected during interviews. Some persons had suggestions for methodological improvement of the Cultural Landscape Classification and calculation of the Conservation Value index. Others shared their views on the degree of generalization necessary for grouping of municipalities. Some thought that natural features were most important for subdividing the Green Belt, some would rather focus on differences between cultural landscapes. A few found transnational thinking essential, others thought that a national approach was a useful first step for the development of guiding concepts.

One thing became clear: A multitude of different views exist on this topic. From this study and especially from the spatial analyses conducted within its framework, however, some conclusions could be drawn:

The two fundamentally different Green Belt regions Waldviertel and Weinviertel should in any case be distinguished. They differ in a regard of natural features, geology, climate and relief

as well as in the configuration and state of cultural landscapes, thus offering different preconditions for conservation work. Of course, Lower Austrian conservation planners are aware of these differences and existing documents like the Lower Austrian Nature Conservation Concept (*Naturschutzkonzept Niederösterreich,* Lower Austrian State Government Office 2011), account for them. Additionally, the Weinviertel is often further subdivided into its northern part and the Danube-Morava-Dyje region (e.g. Naturschutzbund Niederösterreich 2008). This study shows that such differentiation is unnecessary, if not disadvantageous, in regard of cultural landscapes' conservation. If natural features are the main objects of conservation efforts separate treatment of the large floodplains complex is certainly justifiable. However, the urgently necessary interlinkage of natural and cultural landscapes, not least in regard of the Green Belt as an ecological network, is equally relevant for the entire Weinviertel. The northern Weinviertel offers the same natural preconditions as the Danube-Morava-Dyje region and the state of cultural landscapes in both areas can be improved by the same measures.

In regard of more detailed subdivision useful suggestions for methodological improvement of the Cultural Landscape Classification and Conservation Value and Protection Status indices were made (see page 91). Some municipalities might not be optimally classified regarding their cultural landscapes. Further investigation is necessary to provide them with suitable guiding concepts. Also in regard of the indicator variables used for calculation of the Conservation Value some refinements are definitely to be made. More easily accessible data on (semi-) natural biotopes, for instance on forests, would be very advantageous for this. Some previous studies' data on valuable biotopes could not be used for spatial analyses due to differing study area extents. For guiding concept development, however, data produced during past Green Belt projects (e.g. Naturschutzbund Niederösterreich 2008) should definitely be considered. Also, more detailed ecological, zoological and botanical analyses, e.g. species inventories and observation databases, and existing management plans and concepts (e.g. management plans for Natura 2000 sites, see also Strohmeier & Egger 2010, Lower Austrian State Government Office 2011) would provide further essential data on biodiversity and conservation requirements in the area. Whether these methodological alterations are relevant, however, for subdivision of the Lower Austrian Green Belt and development of guiding concepts depends on the level of generalization.

A certain degree of generalization is inevitable if guiding concepts are to be used for larger regions and to promote cooperation. This raised some concerns: People thought that guiding concepts needed to be tailored to each individual valuable site or were afraid that these areas' effective management would suffer from strongly generalized conservation concepts. Firstly, however, it needs to be understood that the generalized guiding concepts developed in this study are not intended to replace specific, spatially explicit management plans for especially valuable sites. They are much rather meant to integrate cultural landscapes and their conservation requirements into the Green Belt framework. Their importance for continuity of the ecological network has perhaps been underrated and shifting the focus to them might turn out to be very beneficial. Secondly, it is very questionable whether guiding concepts or management plans for the preservation of biodiversity can be effective in the long term if they are exclusively applied to relatively small, isolated areas (see also Opdam et al. 2003, Pryke & Samways 2015). Some species are known to inhabit large landscape complexes including many different biotope and land use types. An integrative approach is, again, inevitable at least for the protection of such species.

In regard of the Green Belt's transnational character there has justifiably been some doubt about the usefulness of the unilateral approach employed in this study. It is certainly necessary to protect and develop the European Green Belt transnationally, after all it is transnationality that makes it so valuable. Unfortunately, cross-border conservation work is strongly impeded by incompatible, often difficult-to-access data, language barriers and administrational difficulties. Not only for this study but for many transnational projects these hurdles turn out to be insurmountable. It is therefore inevitable, if not optimal, to sometimes focus resources and efforts on only one half of the Green Belt. Any part of it that can be safeguarded or positively developed is a step forward for the entire Green Belt project. Why not start where can start and do what we can do within our reach?

Once the delimitation of individual Green Belt regions is clear the next step can be taken.

Which factors need consideration during the process of guiding concept development?

Some key issues seem essential for the development of useful and effective guiding concepts for the Lower Austrian Green Belt:

First it needs to be decided whether an integrative or a segregative approach is preferable. There are two opposing points of view on this: While one party's main focus is on the chain of

particularly valuable (near-) natural biotope areas along the (former) border, the other one sees the cultural landscape matrix between them as a vital part of the Green Belt as well (see also Luick 2014). This study's results suggest that at least in Lower Austria an ecological network is impossible to establish without the integration of cultural landscapes. Currently, extensive gaps separate the large biotope areas in the borderlands. If the preservation of a functional biotope network really is the aim of this initiative an integrative approach is imperative (Opdam et al. 2003 & 2006).

Secondly, guiding concepts' implementation needs to be kept in mind during the development process. It was often emphasized that their scopes of application, executing institutions or groups of stakeholders and the targets they are meant to achieve are interdependent and must be harmonized. The approach on municipal level employed in this study might turn out to be beneficial for awareness-raising and generation of interest for the Green Belt idea. Currently, many local politicians and councilmen and -women have no personal connection to nature conservation, some do not even know that "their" municipalities possess valuable sites. This might be changed if guiding concepts on a local scale were provided. Large-scale programmes and conservation plans might often seem too abstract, people might feel they have neither access to nor a say in them. In this regard, the integration of existing local and regional (economic) associations into guiding concepts could be very advantageous as well. Involving local people and making use of existing administrational structures could result in a major step forward for the Green Belt.

In any case, this study's results suggest that a set of well-defined, integrative guiding concepts applicable on local and regional level would greatly enhance the Lower Austrian Green Belt's protection and ease the way for positive development. Visions and clear objectives are essential for the success of such a large-scale project. All pragmatic focus on applied conservation work must not make us lose sight of the big picture. One interviewee very appropriately phrased the key question that we need to ask ourselves: How can the multitude of different landscapes in the borderlands contribute to the Green Belt idea?

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8 Appendix

8.1 Maps

In the following maps municipalities' labels refer to this table:

ID	municipality	ID	municipality	ID	municipality
1	Alberndorf im Pulkautal	37	Hausbrunn	73	Pulkau
2	Altlichtenwarth	38	Hauskirchen	74	Raabs an der Thaya
3	Amaliendorf-Aalfang	39	Heidenreichstein	75	Rabensburg
4	Angern an der March	40	Herrnbaumgarten	76	Reingers
5	Bad Deutsch-Altenburg	41	Hirschbach	77	Retz
6	Bad Großpertholz	42	Hohenau an der March	78	Retzbach
7	Berg	43	Hoheneich	79	Ringelsdorf-Niederabsdorf
8	Bernhardsthal	44	Hohenruppersdorf	80	Rohrau
9	Brand-Nagelberg	45	Hundsheim	81	Sankt Martin
10	Dobersberg	46	Japons	82	Schönkirchen-Reyersdorf
11	Drasenhofen	47	Jedenspeigen	83	Schrattenberg
12	Drosendorf-Zissersdorf	48	Karlstein an der Thaya	84	Schrattenthal
13	Drösing	49	Kautzen	85	Schrems
14	Dürnkrut	50	Kirchberg am Walde	86	Schweiggers
15	Ebenthal	51	Laa an der Thaya	87	Seefeld-Kadolz
16	Eckartsau	52	Langau	88	Spannberg
17	Eggern	53	Langschlag	89	Staatz
18	Eisgarn	54	Lassee	90	Stronsdorf
19	Engelhartstetten	55	Litschau	91	Sulz im Weinviertel
20	Falkenstein	56	Ludweis-Aigen	92	Thaya
21	Fallbach	57	Mailberg	93	Unserfrau-Altweitra
22	Gänserndorf	58	Marchegg	94	Untersiebenbrunn
23	Gastern	59	Matzen-Raggendorf	95	Unterstinkenbrunn
24	Gaubitsch	60	Moorbad Harbach	96	Velm-Götzendorf
25	Geras	61	Nappersdorf-Kammersdorf	97	Waldenstein
26	Gmünd	62	Neudorf bei Staatz	98	Waldkirchen an der Thaya
27	Großdietmanns	63	Neusiedl an der Zaya	99	Weiden an der March
28	Großharras	64	Obersiebenbrunn	100	Weikendorf
29	Großkrut	65	Ottenthal	101	Weitersfeld
30	Großschönau	66	Palterndorf-Dobermannsdorf	102	Weitra
31	Guntersdorf	67	Pernersdorf	103	Wildendürnbach
32	Hadres	68	Petronell-Carnuntum	104	Wolfsthal
33	Hainburg an der Donau	69	Pfaffenschlag bei Waidhofen/Thaya	105	Wullersdorf
34	Hardegg	70	Poysdorf	106	Zellerndorf
35	Haugschlag	71	Prellenkirchen	107	Zistersdorf
36	Haugsdorf	72	Prottes		

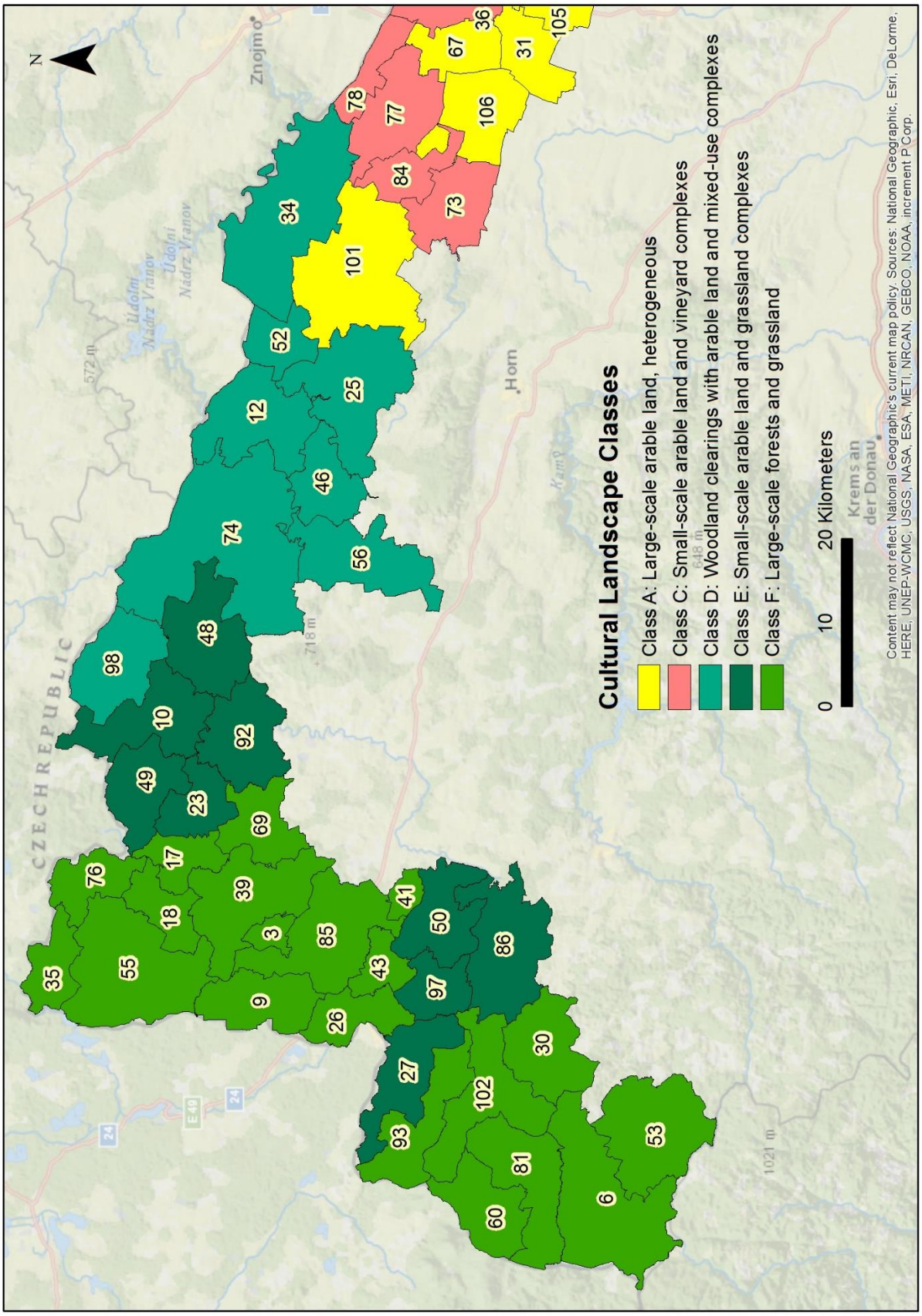

Figure 6: Cultural Landscape Classes of the Waldviertel Green Belt

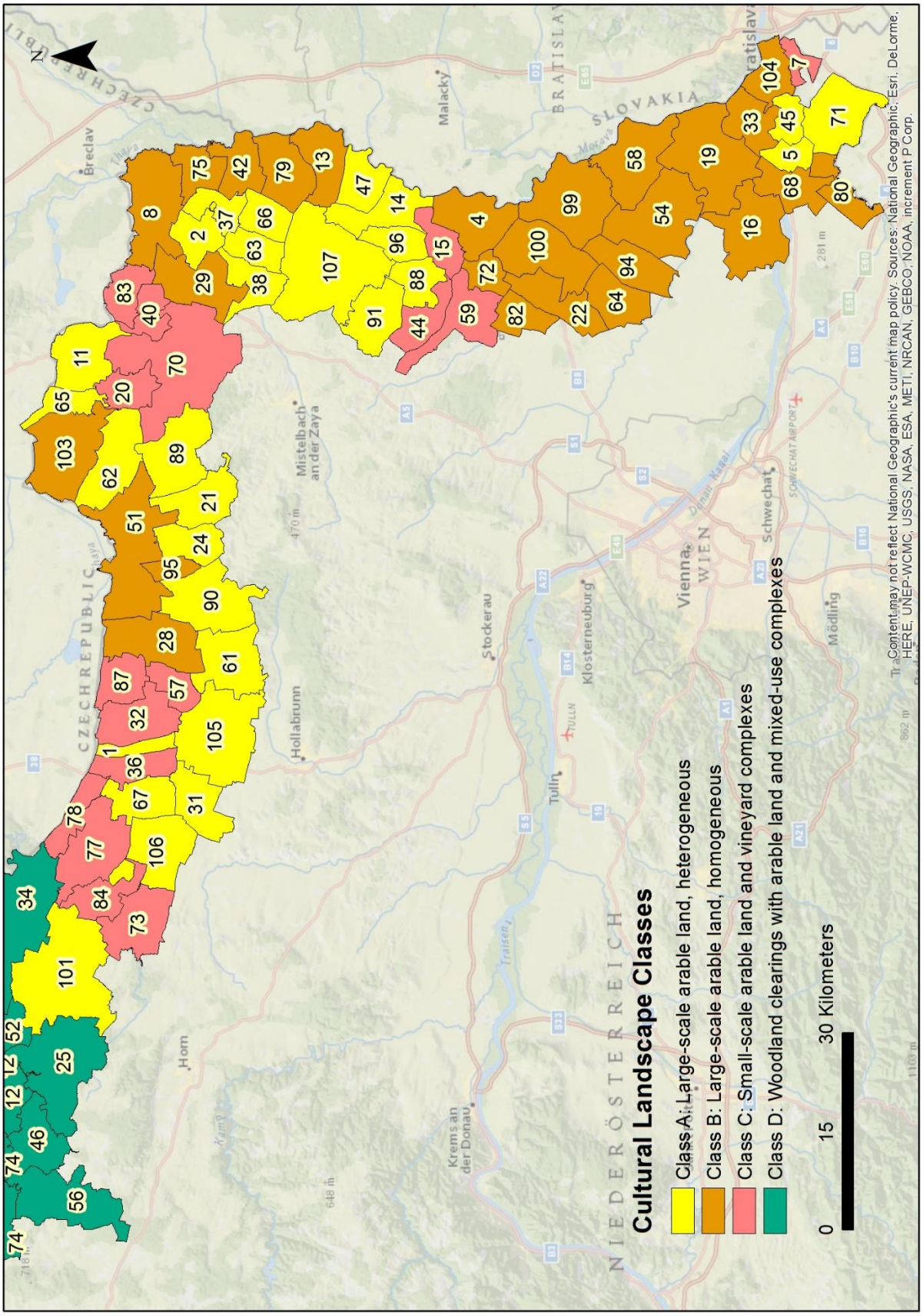

Figure 7: Cultural Landscape Classes of the Weinviertel Green Belt

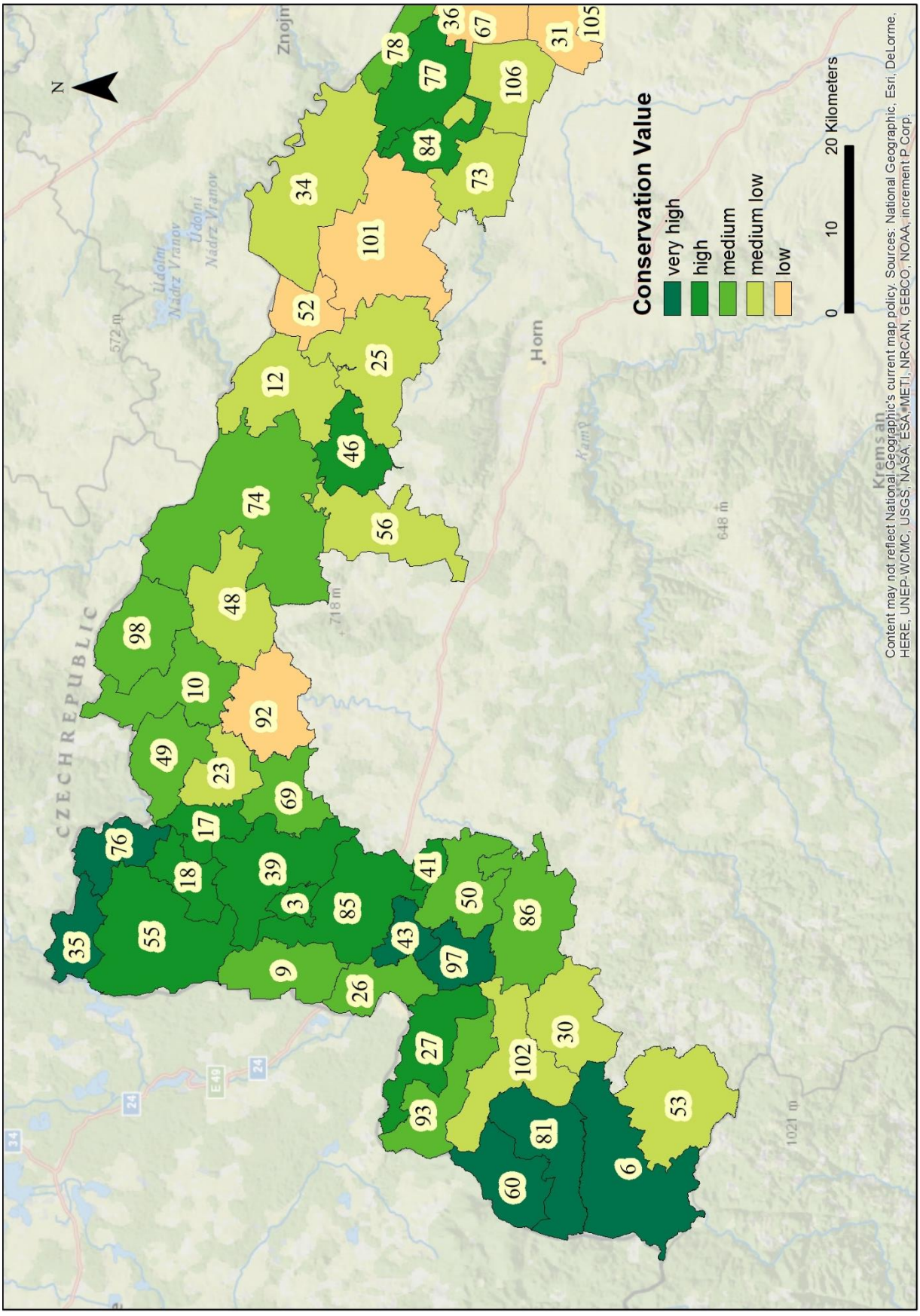

Figure 8: Conservation Values of the Waldviertel Green Belt

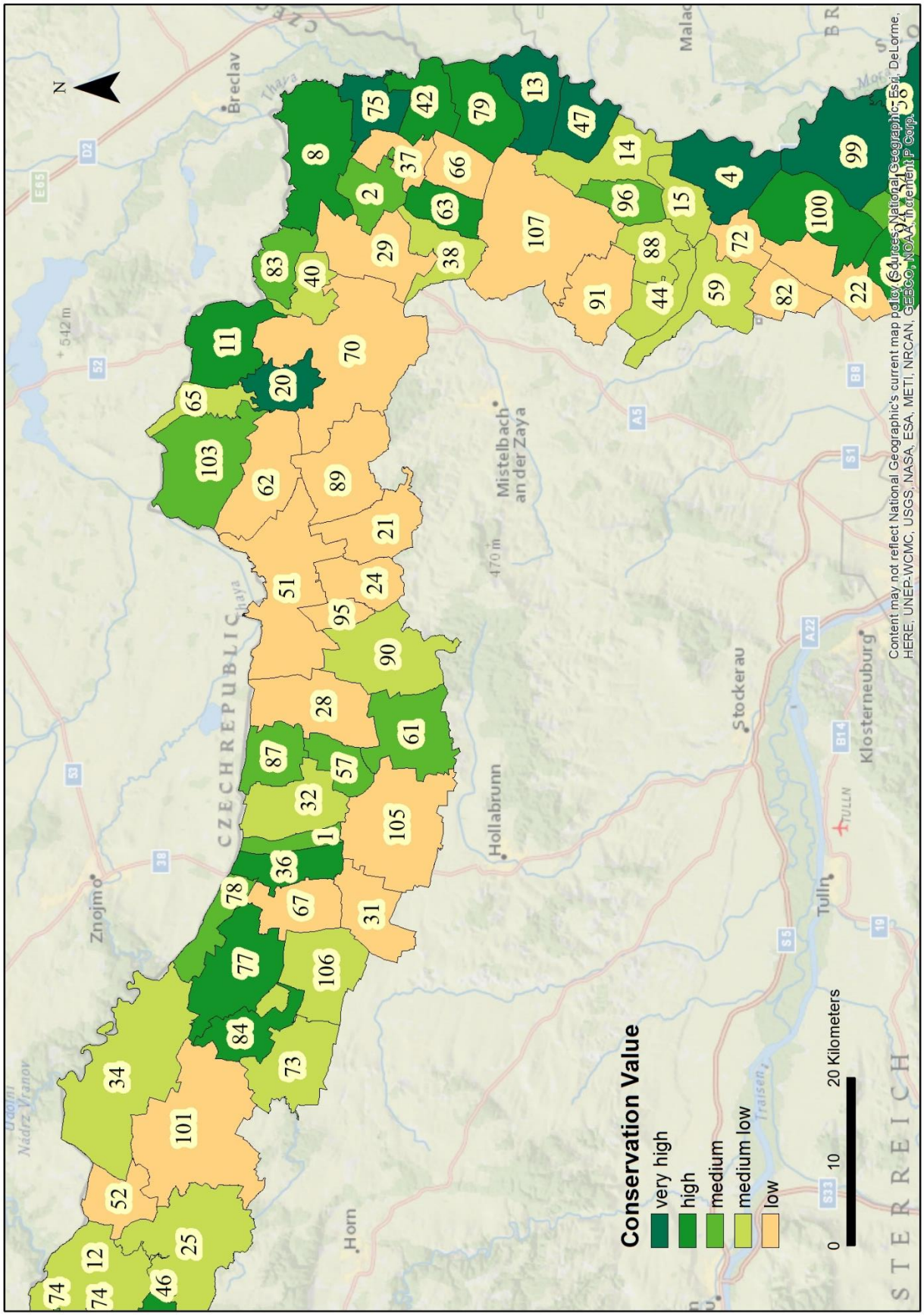

Figure 9: Conservation Values of the northern Weinviertel Green Belt

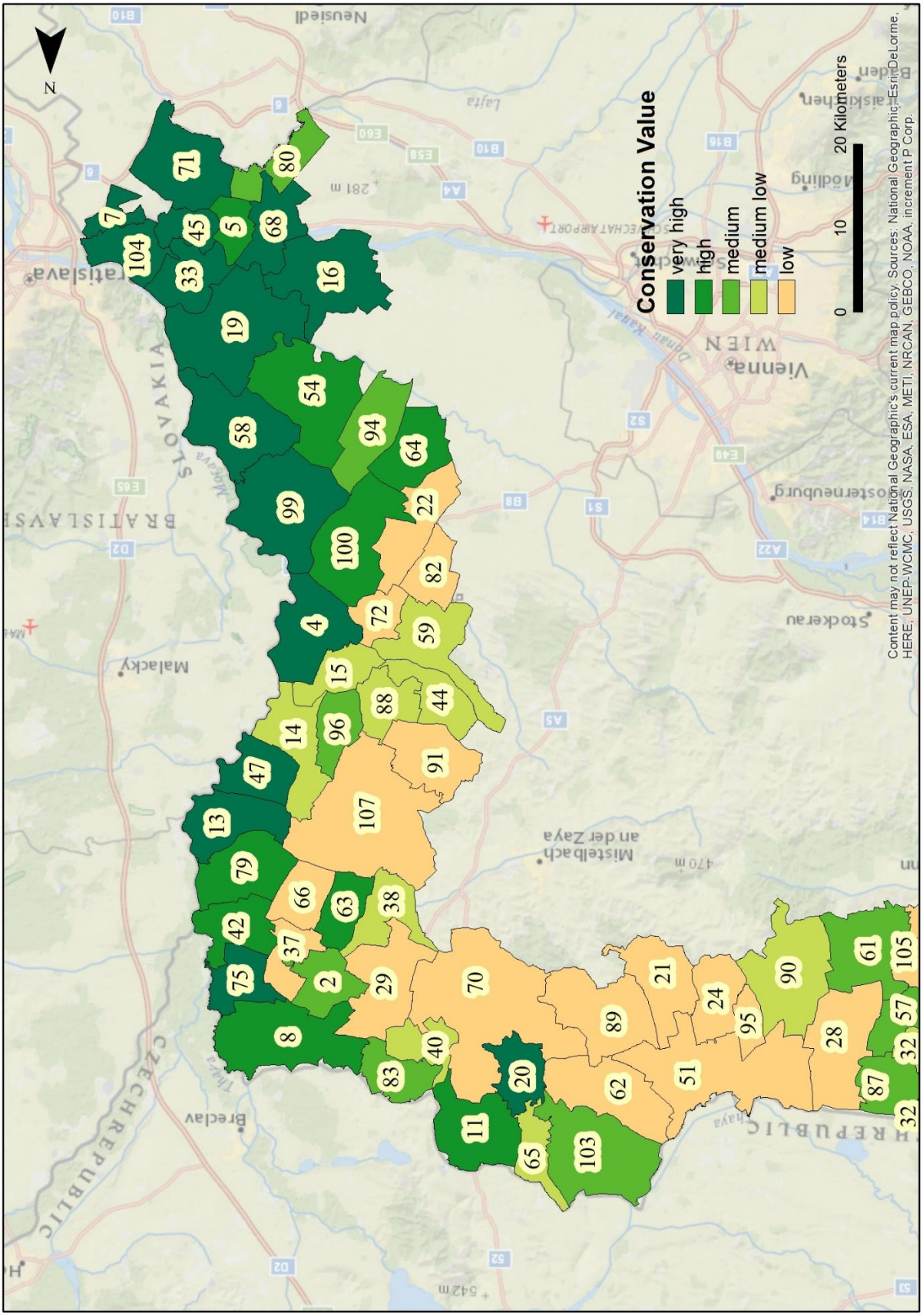

Figure 10: Conservation Values of the Green Belt in the Danube-Morava-Dyje region

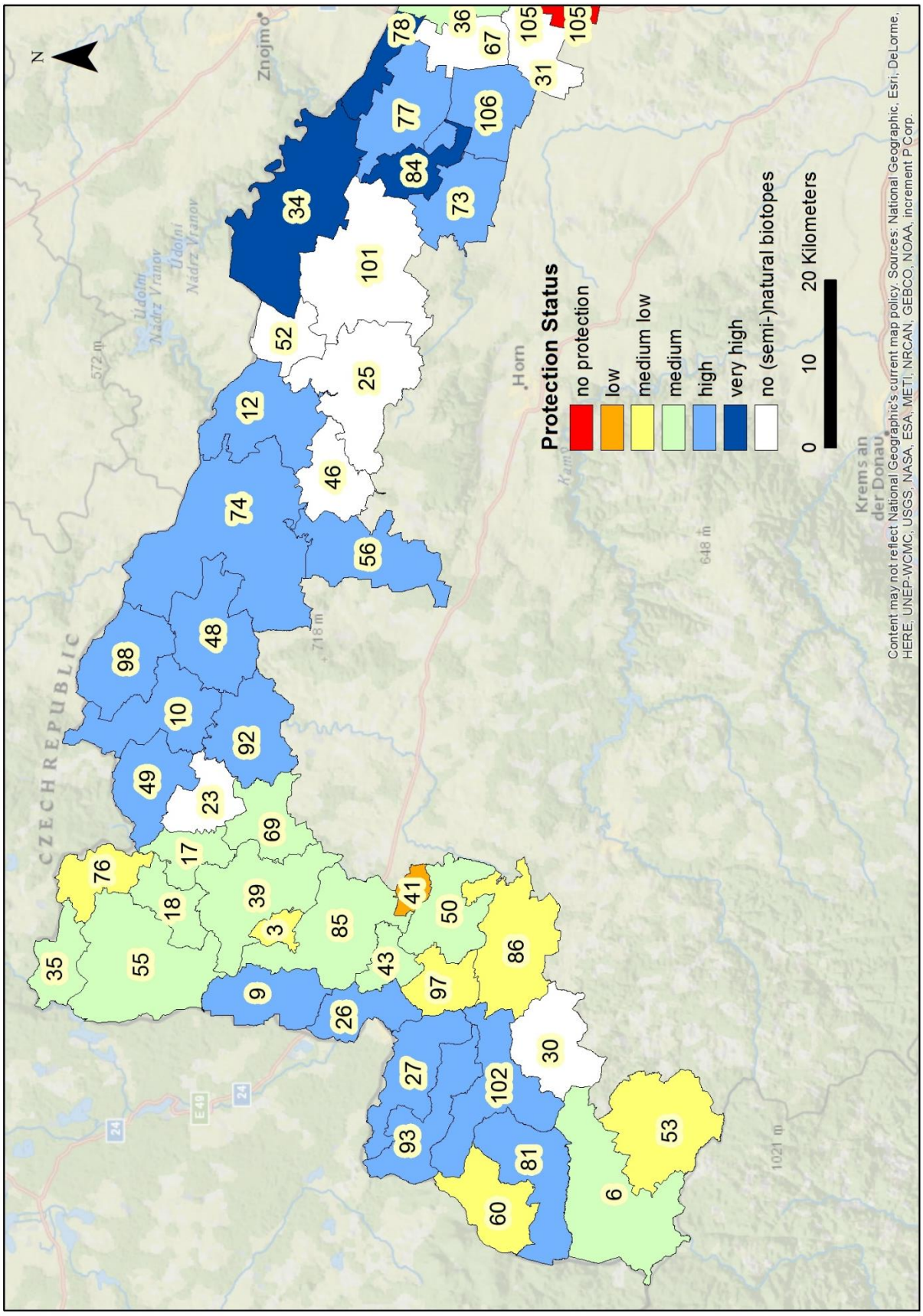

Figure 11: Protection Status of the Waldviertel Green Belt

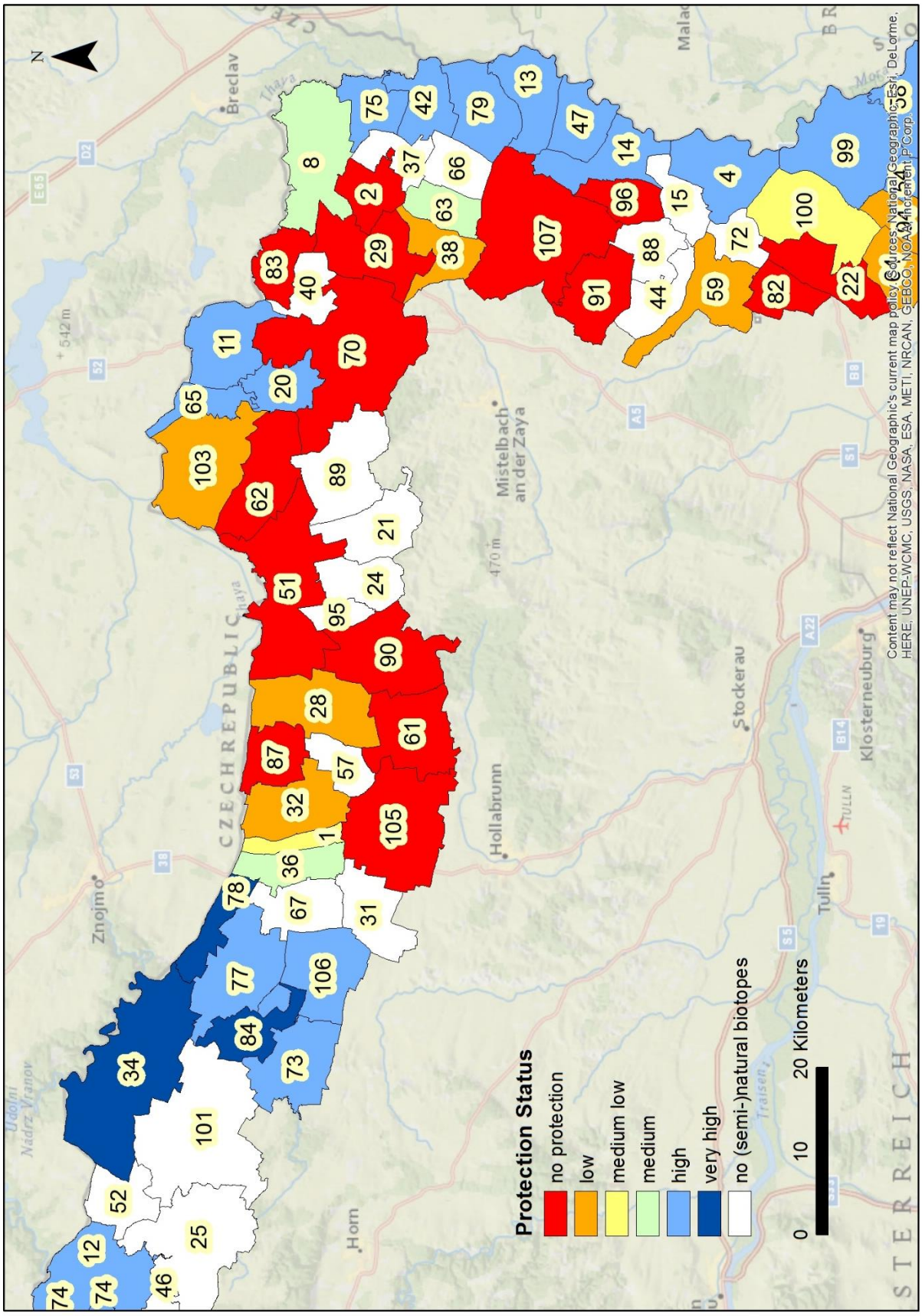

Figure 12: Protection Status of the northern Weinviertel Green Belt

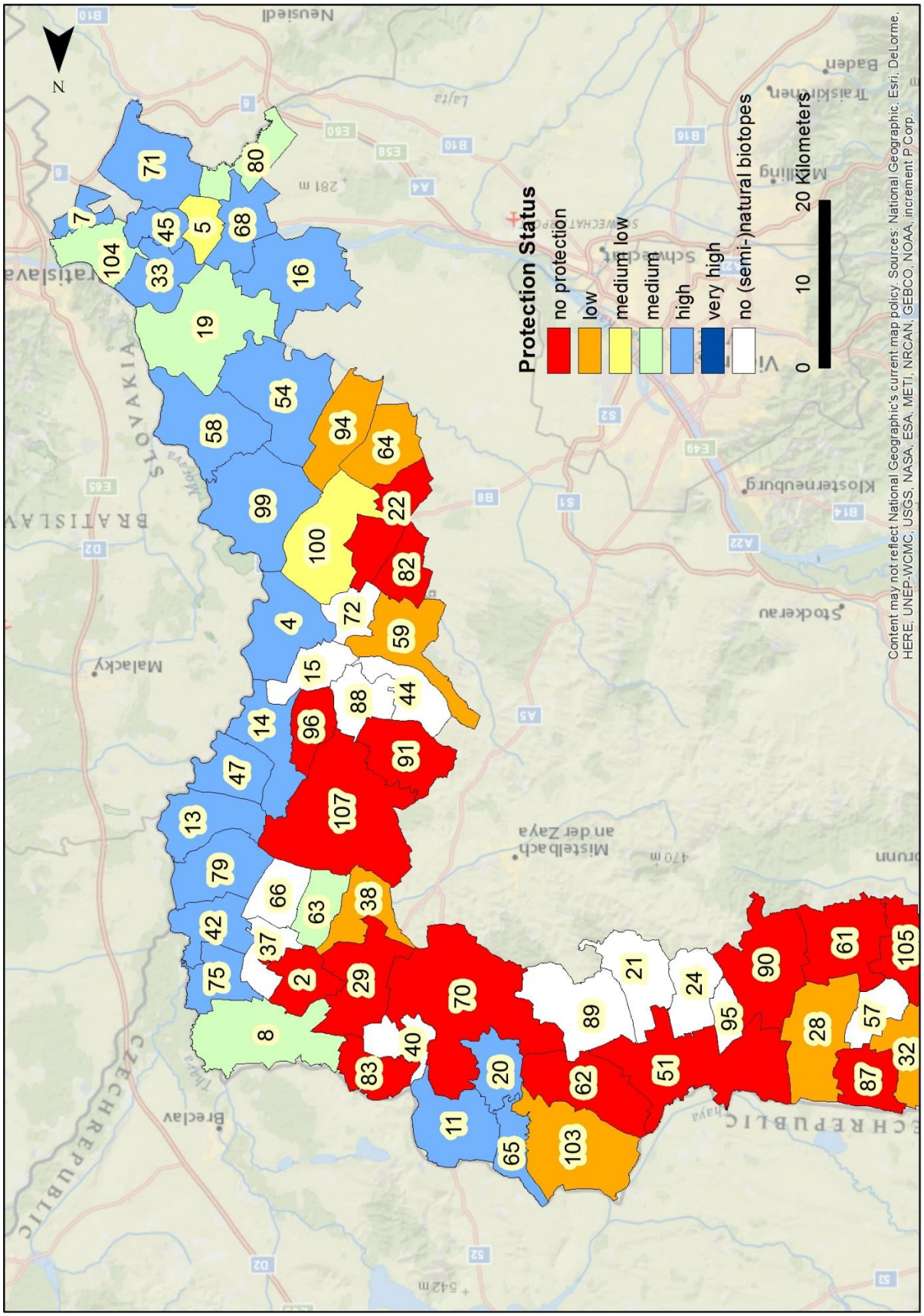

Figure 13: Protection Status of the Green Belt in the Danube-Morava-Dyje region

8.2 Lists

Table 9: Cultural Landscape Classes, Conservation Value and Protection Status of Lower Austrian Green Belt municipalities

Municipality	Cultural Landscape Class[1]	Conservation Value[2]	Protection Status[3]
Alberndorf im Pulkautal	A	medium	medium low
Altlichtenwarth	A	medium	no protection
Amaliendorf-Aalfang	F	high	medium low
Angern an der March	B	very high	high
Bad Deutsch-Altenburg	A	high	medium low
Bad Großpertholz	F	very high	medium
Berg	C	very high	high
Bernhardsthal	B	high	medium
Brand-Nagelberg	F	medium	high
Dobersberg	E	medium	high
Drasenhofen	A	high	high
Drosendorf-Zissersdorf	D	medium low	high
Drösing	B	very high	high
Dürnkrut	A	medium low	high
Ebenthal	C	medium low	no (semi-)natural biotopes
Eckartsau	B	very high	high
Eggern	F	high	medium
Eisgarn	F	high	medium
Engelhartstetten	B	very high	medium
Falkenstein	C	very high	high
Fallbach	A	low	no (semi-)natural biotopes
Gänserndorf	B	low	no protection
Gastern	E	medium low	no (semi-)natural biotopes

Table 9: Cultural Landscape Classes, Conservation Value and Protection Status of Lower Austrian Green Belt municipalities

Municipality	**Cultural Landscape Class[1]**	**Conservation Value[2]**	**Protection Status[3]**
Gaubitsch	A	low	no (semi-)natural biotopes
Geras	D	medium low	no (semi-)natural biotopes
Gmünd	F	medium	high
Großdietmanns	E	high	high
Großharras	B	low	low
Großkrut	B	low	no protection
Großschönau	F	medium low	no (semi-)natural biotopes
Guntersdorf	A	low	no (semi-)natural biotopes
Hadres	C	medium low	low
Hainburg an der Donau	B	very high	very high
Hardegg	D	medium low	very high
Haugschlag	F	very high	medium
Haugsdorf	C	high	medium
Hausbrunn	A	low	no (semi-)natural biotopes
Hauskirchen	A	medium low	low
Heidenreichstein	F	high	medium
Herrnbaumgarten	C	medium low	no (semi-)natural biotopes
Hirschbach	F	high	low
Hohenau an der March	B	high	high
Hoheneich	F	very high	medium
Hohenruppersdorf	C	medium low	no (semi-)natural biotopes
Hundsheim	A	very high	very high
Japons	D	high	no (semi-)natural biotopes

Table 9: Cultural Landscape Classes, Conservation Value and Protection Status of Lower Austrian Green Belt municipalities

Municipality	**Cultural Landscape Class[1]**	**Conservation Value[2]**	**Protection Status[3]**
Jedenspeigen	A	very high	high
Karlstein an der Thaya	E	medium low	high
Kautzen	E	medium	high
Kirchberg am Walde	E	medium	medium
Laa an der Thaya	B	low	no protection
Langau	D	low	no (semi-)natural biotopes
Langschlag	F	medium low	medium low
Lassee	B	high	high
Litschau	F	high	medium
Ludweis-Aigen	D	medium low	high
Mailberg	C	medium	no (semi-)natural biotopes
Marchegg	B	very high	high
Matzen-Raggendorf	C	medium low	low
Moorbad Harbach	F	very high	medium low
Nappersdorf-Kammersdorf	A	medium	no protection
Neudorf bei Staatz	A	low	no protection
Neusiedl an der Zaya	A	high	medium
Obersiebenbrunn	B	high	low
Ottenthal	A	medium low	very high
Palterndorf-Dobermannsdorf	A	low	no (semi-)natural biotopes
Pernersdorf	A	low	no (semi-)natural biotopes
Petronell-Carnuntum	B	very high	high
Pfaffenschlag bei Waidhofen an der Thaya	F	medium	high
Poysdorf	C	low	no protection
Prellenkirchen	A	very high	high

Table 9: Cultural Landscape Classes, Conservation Value and Protection Status of Lower Austrian Green Belt municipalities

Municipality	**Cultural Landscape Class[1]**	**Conservation Value[2]**	**Protection Status[3]**
Prottes	B	low	no (semi-)natural biotopes
Pulkau	C	medium low	high
Raabs an der Thaya	D	medium	high
Rabensburg	B	very high	high
Reingers	F	very high	medium low
Retz	C	high	high
Retzbach	C	medium	very high
Ringelsdorf-Niederabsdorf	B	high	high
Rohrau	B	medium	medium
Sankt Martin	F	very high	high
Schönkirchen-Reyersdorf	B	low	no protection
Schrattenberg	C	medium	no protection
Schrattenthal	C	high	very high
Schrems	F	high	medium
Schweiggers	E	medium	medium low
Seefeld-Kadolz	C	medium	no protection
Spannberg	A	medium low	no (semi-)natural biotopes
Staatz	A	low	no (semi-)natural biotopes
Stronsdorf	A	medium low	no protection
Sulz im Weinviertel	A	low	no protection
Thaya	E	low	high
Unserfrau-Altweitra	F	medium	high
Untersiebenbrunn	B	medium	low
Unterstinkenbrunn	B	low	no (semi-)natural biotopes
Velm-Götzendorf	A	medium	no protection

Table 9: Cultural Landscape Classes, Conservation Value and Protection Status of Lower Austrian Green Belt municipalities

Municipality	**Cultural Landscape Class**[1]	**Conservation Value**[2]	**Protection Status**[3]
Waldenstein	E	very high	medium low
Waldkirchen an der Thaya	D	medium	high
Weiden an der March	B	very high	high
Weikendorf	B	high	medium low
Weitersfeld	A	low	no (semi-)natural biotopes
Weitra	F	medium low	high
Wildendürnbach	B	medium	low
Wolfsthal	B	very high	medium
Wullersdorf	A	low	no protection
Zellerndorf	A	medium low	very high
Zistersdorf	A	low	no protection

[1] see Results section (page 43) for explanations, A = Large-scale arable land, heterogeneous, B = Large-scale arable land, homogeneous, C = Small-scale arable land and vineyard complexes, D = Woodland clearings with arable land and mixed-use complexes, E = Small-scale arable land and grassland complexes, F = Large-scale forests and grassland

[2] see Results section (page 47) for explanations

[3] see Results section (page 50) for explanations

Table 10: List of cultural landscape types after Schmitzberger et al. 2003 (reduced)

ID	description
202	Large extra-alpine forest islands
203	Belts of alluvial forests along large rivers
204	Forest-dominated gorges and narrow valleys
205	Forest-dominated highlands
307	Grassland-dominated extra-alpine valleys and depressions
308	Grassland-dominated extra-alpine mountains / highlands
311	Large extra-alpine dry grasslands and pastures
403	Extra-alpine hills dominated by grain farming
404	Extra-alpine basins and valley floors dominated by grain farming
405	Extra-alpine woodland clearings dominated by crop farming
408	Extra-alpine mountains dominated by crop farming
601	Plains and gentle slopes dominated by viticulture
602	Steep slopes dominated viticulture
603	Pannonian viticulture and crop farming complexes
702	Agglomerations along trans-regional transport axes
705	Suburban areas and small towns
706	Large surface mining areas and landfills

8.1 Interview questionnaires

8.1.1 Exploratory interviews

INITIATIVE GRÜNES BAND

1) Wie ist die Initiative „Grünes Band“ (Initiatoren, Haupt“verantwortliche“, Übernahme der Biotoppflege, Institutionen etc.) in
    a. Deutschland
        i. organisiert?
        ii. koordiniert?
        iii. Gäbe es die institutionellen Möglichkeiten für verstärkte Forschung, Monitoring, Pflege etc. am GBD?

    b. Österreich
        i. organisiert?
        ii. koordiniert?
        iii. Gäbe es die institutionellen Möglichkeiten für verstärkte Forschung, Monitoring, Pflege etc. am GBÖ?

2) Wie gut vernetzt & koordiniert ist die Initiative Grünes Band hinsichtlich der Formulierung von Zielvorgaben, Leitbildern (oder allgemein: der Naturschutz-Planung) in
    a. Deutschland?
    b. Österreich?

3) Wie gut koordiniert ist die Initiative Grünes Band hinsichtlich Umsetzung von naturschutzfachlichen Zielvorgaben in
    a. Deutschland?
    b. Österreich?

4) Wie beurteilen Sie die Motivation für Umsetzung von Naturschutz-Zielen, Weiterentwicklung des Grünen Bandes, Teamgeist, etc. der Initiative am Grünen Band
    a. Deutschland?
        i. Was könnte der Grund für die gute/schlechte Situation sein?

    b. Österreich?
        i. Was könnte der Grund für die gute/schlechte Situation sein?

5) Wie beurteilen Sie im Vergleich zu anderen nationalen Grünes Band – Initiativen (Motivation, Koordination, Teamgeist, etc.) die Initiative Grünes Band
    a. Deutschland?
    b. Österreich?

6) Schwierigkeiten am Grünen Band
    a. Deutschland:
        i. Welche Regionen sind „Sorgenkinder“?
        ii. Welche Probleme administrativer oder koordinativer Art gibt es?

    b. Österreich:
        i. Welche Regionen sind „Sorgenkinder“?
        ii. Welche Probleme administrativer oder koordinativer Art gibt es?

LEITBILDER / NATURSCHUTZFACHLICHE ZIELVORGABEN

7) Gibt es ein übergeordnetes Ziel für die Entwicklung des Grünen Bandes
    a. Deutschland?
        i. Gibt es Biotope, auf die ein Hauptaugenmerk gelegt wird?
        ii. Wie gut wird dieses Ziel in die Umsetzung des Naturschutzes am GBD integriert?

    b. Österreich?
        i. Gibt es Biotope, auf die ein Hauptaugenmerk gelegt wird?
        ii. Wie gut wird dieses Ziel in die Umsetzung des Naturschutzes am GBÖ integriert?

    c. Zentraleuropas?
        i. In wie weit können die deutschen Zielvorgaben / Leitbilder auf andere Länder (Österreich) angewendet werden?

8) Leitbilder/naturschutzfachlichen Zielvorgaben für Pflege/Schutz
    a. des Grünen Bandes Deutschland:
        i. Wer definiert diese Leitbilder?

    b. des Grünen Bandes Österreich:
        i. Wer definiert diese Leitbilder?

9) Gibt es flächendeckend naturschutzfachliche Leitbilder für das Grüne Band
    a. Deutschland?
        i. Sind diese Leitbilder räumlich explizit (flächenscharf) oder allgemein gehalten?

    b. Österreich?
        i. Sind diese Leitbilder räumlich explizit (flächenscharf) oder allgemein gehalten?

10) Gibt es Arteninventare / Biotopkartierungsdaten für das Grüne Band
    a. Deutschland?
        i. Wenn ja, sind diese flächendeckend?
        ii. Aus welchem/n Jahr(en) stammen sie?

    b. Österreich?
        i. Wenn ja, sind diese flächendeckend?
        ii. Aus welchem/n Jahr(en) stammen sie?

11) Sind die Leitbilder (gesetzlich) verbindlich am Grünen Band
    a. Deutschland?
    b. Österreich?

12) Wird die richtige Umsetzung/das Erreichen der Zielvorgaben/Leitbilder bzw. eine Entwicklung in die richtige Richtung
    a. in Deutschland überprüft?
        i. Wenn ja, wie?

    b. in Österreich überprüft?
        i. Wenn ja, wie?

13) Wie schätzen Sie die Wichtigkeit von Leitbildern, deren Koordination und die Koordination ihrer Umsetzung für den Naturschutz am Grünen Band
    a. Deutschland ein?
        i. Gibt es in diesem Zusammenhang Defizite / Probleme am GBD?

    b. Österreich ein?
        i. Gibt es in diesem Zusammenhang Defizite / Probleme am GBÖ?

ALLGEMEINES

14) Gesetzliche Basis des Grünen Bandes in
    a. Deutschland?
        i. Wem gehören die Flächen?
        ii. Wie ist das GBD rechtlich verankert?
        iii. In wie weit sind die Flächen des GBD rechtlich geschützt?
        iv. Gibt es Pflichten, die aus dem rechtlichen Schutz erwachsen? Wer nimmt diese wahr?
        v. Ist das GBD in der Raumordnung verankert?
        vi. In wie weit muss die Raumplanung auf Naturschutz (zB das GBD) Rücksicht nehmen?
        vii. Ist nationaler Biotopverbund gesetzlich verankert?

    b. Österreich?
        i. Wem gehören die Flächen?
        ii. Wie ist das GBÖ rechtlich verankert?
        iii. In wie weit sind die Flächen des GBÖ rechtlich geschützt?
        iv. Gibt es Pflichten, die aus dem rechtlichen Schutz erwachsen? Wer nimmt diese wahr?
        v. Ist das GBÖ in der Raumordnung verankert?
        vi. In wie weit muss die Raumplanung auf Naturschutz (zB das GBD) Rücksicht nehmen?
        vii. Ist nationaler Biotopverbund gesetzlich verankert?

15) Forschung am Grünen Band
    a. Deutschland:
        i. Welche sind die Hauptthemen dieser Forschung?
        ii. Wer führt Forschungsarbeiten durch?
        iii. Wer bezahlt dafür?
        iv. Können Sie mir Meilenstein-Forschungsarbeiten am GBD nennen?

    b. Österreich:
        i. Welche sind die Hauptthemen dieser Forschung?
        ii. Wer führt Forschungsarbeiten durch?
        iii. Wer bezahlt dafür?
        iv. Können Sie mir Meilenstein-Forschungsarbeiten am GBÖ nennen?

16) Wie gestaltet sich die Finanzierung der Initiative, der angewandten Naturschutzarbeit, etc. am Grünen Band
    a. Deutschland?
        i. Wie ist die allgemeine finanzielle Situation der Initiative?
        ii. Gibt es die finanziellen Möglichkeiten für verstärkte Forschung, Monitoring, Pflege etc. am GBD?

    b. Österreich?
        i. Wie ist die allgemeine finanzielle Situation der Initiative?
        ii. Gibt es die finanziellen Möglichkeiten für verstärkte Forschung, Monitoring, Pflege etc. am GBÖ?

8.1.2 Expert interviews

ALLGEMEINES

1) Haben Sie sich schon jemals mit dem Grünen Band (Nieder-) Österreichs beschäftigt?
    a. Wenn ja, seit wann? Inwiefern?

2) Halten Sie es für sinnvoll, im Naturschutz von einem Grünen Band Niederösterreichs zu sprechen?
    a. Warum (nicht)?

3) Halten Sie es für sinnvoll, naturschutzfachliche Leitbilder spezifisch für das Grüne Band Niederösterreichs zu erstellen? Warum (nicht)?
    a. Wenn nicht: Welche Bezugsräume für naturschutzfachliche Leitbilder für die Grenzregionen Niederösterreichs würden Sie bevorzugen?

LEITBILDER

4) Sehen Sie sich bitte die Karte der Kulturlandschaftsklassen an!
Können Sie einen gemeinsamen Soll-Zustand der Landschaft, eine Vision für jede dieser Klassen beschreiben?
    a. Wenn nicht: Wie würden Sie die Klassen weiter differenzieren, und wie sollte die Landschaft in diesen Teilen idealerweise aussehen?

5) Sehen Sie sich bitte die Karte der naturschutzfachlichen Bedeutungswerte der Gemeinden an!
Sollte es Ihrer Meinung nach unterschiedliche Leitbilder/Visionen je nach Bedeutungswert der Gemeinden geben?
    a. Bitte beschreiben Sie diese unterschiedlichen Leitbilder (Soll-Zustände der Landschaft) für die dunkelgrünen/hellgrünen/rötlichen Gemeinden!

LEITARTEN

6) Sehen Sie sich bitte die Karte der Kulturlandschaftsklassen an!
Können Sie mir gemeinsame Leitarten für jede dieser Kulturlandschaftsklassen nennen?
    a. Wenn nicht: Wie würden Sie die Klassen weiter differenzieren, und welche Leitarten würden Sie für diese Teile vorschlagen?
    b. Warum gerade diese Arten?

MASSNAHMEN

7) Können Sie mir konkrete Maßnahmen nennen, die für die Erreichung der genannten Leitbilder förderlich sein könnten?

8) Sehen Sie sich bitte die Karte der Prozentanteile geschützter Schutzgüter in den Gemeinden an!
Würden Sie die genannten Maßnahmen aufgrund dieser Karte weiter differenzieren?
    a. Wenn ja: Bitte beschreiben Sie, worauf in den blauen/orangen/roten Gemeinden in Hinblick auf den Naturschutz geachtet werden sollte!

9 Zusammenfassung

Das Europäische Grüne Band erstreckt sich entlang des ehemaligen Eisernen Vorhangs durch ganz Europa und verbindet dabei ausgedehnte, naturnahe Biotopflächen und wertvolle Kulturlandschaften mit wachsenden Siedlungsräumen und intensiv genutzten Agrarlandschaften. Das zentrale Ziel der Initiative Grünes Band Europa ist der Erhalt und die Wiederherstellung eines paneuropäischen ökologischen Netzwerks mit verbindender Funktion sowohl für Arten und Habitate als auch für die Naturschutzarbeit. Diese Studie beschäftigt sich mit dem momentanen Status Quo der Initiative Grünes Band Österreich in Hinsicht auf Organisationsstrukturen und Naturschutzaktivitäten. Weiters wurde eine räumliche Analyse eines spezifischen Teils des Österreichischen Grünen Bandes, der Grenzgebiete Niederösterreichs, durchgeführt. Sie gibt Einblick in den Wert der Landschaften dieser Region für den Naturschutz und zeigt deutlich, dass der langjährige bewahrende Einfluss des Eisernen Vorhangs auf die grenznahen Gebiete immer noch nachwirkt. Sowohl Kulturlandschaften als auch (halb-) natürliche Biotopflächen können und sollten zur Intaktheit des Grünen Bandes und seiner Funktion als ökologisches Netzwerk beitragen. Über Grenzen, Verwaltungsebenen und Sektoren hinweg koordinierte naturschutzfachliche Leitbilder und -konzepte sind essentiell für den erfolgreichen Schutz und die ökologische Entwicklung des Grünen Bandes. In dieser Arbeit sind Komponenten solcher Leitbilder und –konzepte für die Gemeinden im Niederösterreichischen Grünen Band zusammengetragen. Es wird deutlich, dass die Ansätze des Naturschutzes an die verschiedenen Landschaften angepasst werden müssen, um die unterschiedlichen Ausgangssituationen optimal zu nutzen. Für jene, die in den Naturschutz in den Grenzregionen und in die Initiative Grünes Band involviert sind, bietet diese Arbeit konkrete Vorschläge für die zukünftige Entwicklung der Initiative Grünes Band Österreich und der Niederösterreichischen Grenzgebiete.

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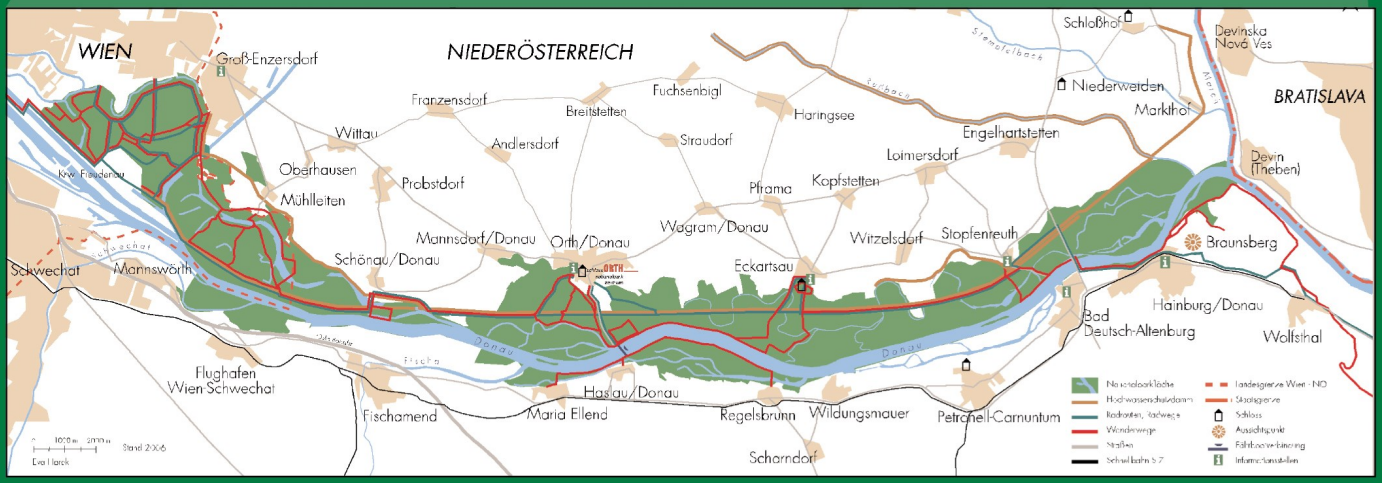

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