



NOVA SCHOOL OF  
BUSINESS & ECONOMICS

A Work Project presented as part of the requirements for the Award of a  
Master's Degree in Economics from the Nova School of Business and Economics.

---

# **Improved Environmental and Economic Protection of Conservation-Worthy Ecosystems**

**A socioeconomic study applied to  
the case of the Alpstein region in Switzerland**

---

Dano Hersche - 53718

A Project carried out under the supervision of:

Prof. Dr. Maria Antonieta Cunha-e-Sá,

Full Professor of Economics

3 June, 2024

## Abstract

Over-exploitation of ecosystem services and lacking implementation of conservation efforts are challenges that world economies are facing and force policy makers and practitioners to rethink their approaches to natural capital. This thesis develops a potential framework to improve environmental and economic protection of the Alpstein region in Switzerland, by incorporating ecosystem service valuation and stakeholder participation. Following the analysis of 20+ in-person interviews with regional stakeholders, the study finds that declaring the Alpstein region to an official *Nature Park* under Swiss regulation is a feasible approach to ensure the ecosystem's long-term conservation while accounting for stakeholder's priorities and concerns.

*Keywords:* Environmental Conservation, Research-Implementation Gap, Ecosystem Service Valuation, Stakeholder Participation, Alpine Ecosystems, Alpstein, Switzerland

## Acknowledgements

I would like to express my heartfelt gratitude to all those who have contributed to the completion of this thesis and ongoing project. I am grateful for my supervisor, Prof. Dr. Maria Antonieta Cunha e Sá, as well as my parents, Susanne & Markus Hersche, and my partner, Sofia Vámos. Without their support, guidance, and encouragement, this achievement would not have been possible. Furthermore, I extend my appreciation to all the participants who generously contributed their time and knowledge for the research of this thesis. Their involvement has been crucial in shaping the empirical foundation of this study.

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

# Table of Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
<b>2</b>	<b>Literature Review</b>	<b>3</b>
<b>3</b>	<b>Case Study</b>	<b>6</b>
<b>4</b>	<b>Methodology</b>	<b>8</b>
4.1	Stakeholder Map . . . . .	8
4.2	Qualitative Research . . . . .	10
<b>5</b>	<b>Results</b>	<b>12</b>
5.1	Ecosystem Services . . . . .	12
5.2	Attitude . . . . .	15
5.3	Challenges . . . . .	16
<b>6</b>	<b>Discussion</b>	<b>18</b>
6.1	Potential Conservation Framework . . . . .	18
6.2	Implications for Stakeholders . . . . .	21
6.3	Project Implementation . . . . .	22
<b>7</b>	<b>Conclusion</b>	<b>24</b>
	<b>References</b>	<b>iv</b>
<b>A</b>	<b>Appendix</b>	<b>xii</b>
A.1	Interviews . . . . .	xii
A.2	Graphs . . . . .	xiv
A.3	Regulatory Environment . . . . .	xix

## List of Figures

Fig. 1:	Total and Percentage of Mentions of Ecosystem Services . . . . .	12
Fig. 2:	Mean Economic Importance Ratings of Ecosystem Services . . . . .	13
Fig. 3:	Mean Worry Ratings of Ecosystem Services . . . . .	14
Fig. 4:	Organizational Structure, Project Nature Park Alpstein . . . . .	19
Fig. 5:	Distribution of Importance by Ecosystem Service Groups (Ratings 2-5) . . .	xiv
Fig. 6:	Box Plot of Economics Importance Ratings for Ecosystem Services . . . . .	xiv
Fig. 7:	Top 5 Mean Economic Importance Ratings by Stakeholder Group . . . . .	xv
Fig. 8:	Distribution of Worry Ratings by Ecosystem Service Groups (Ratings 2-5) .	xvi
Fig. 9:	Box Plot of Worry Ratings for Ecosystem Services . . . . .	xvi
Fig. 10:	Top 5 Mean Worry Ratings by Stakeholder Group . . . . .	xvii
Fig. 11:	Distribution of Policy and Adaptation Ratings . . . . .	xviii
Fig. 12:	Box Plot of Policy and Adaptation Ratings . . . . .	xviii
Fig. 13:	Zone Plan Nature Park Alpstein, macro perspective . . . . .	xxiii
Fig. 14:	Zone Plan Nature Park Alpstein, micro perspective . . . . .	xxiii
Fig. 15:	Biodiversity & Landscape Value, Alpstein Region . . . . .	xxiv

## List of Tables

Tab. 1:	Descriptive Statistics of Policy Responses . . . . .	16
Tab. 2:	Pre-Requirements for Regional Nature Parks . . . . .	23
Tab. 3:	Overview of Ecosystem Services . . . . .	xii



# 1 Introduction

Ecosystems (or biomes) are communities or geographic areas in which living organisms and abiotic pools (the physical environment) live in conjunction with each other, interacting as a system (Mace et al., 2012). Due to complex interactions and feedback loops within ecosystems, even small but frequent influences can trigger a cascade of interconnected effects on both natural and human systems (Kellogg, 1983; Ripple et al., 2023). Increasing human activity and climate change impact ecosystems and alter the spatial distribution and behavior of plant and animal species over time (Garrett et al., 2011). These changes can have spiraling effects on food webs, ecosystem functions, and biodiversity (Intergovernmental Panel on Climate Change (IPCC), 2022). As ecosystems become increasingly disrupted, their ability to provide crucial services will most likely decline (Millennium Ecosystem Assessment (MA), 2005). Commonly referred to as ecosystem services, amenities such as carbon sequestration and water purification, or economic goods, such as food, biomass, or the ecosystem's cultural value, benefit people socioeconomically. These services can directly and indirectly impact different dimensions of human well-being (including physical, social, economic, and psychological) and are, thus, inevitable for human development and prosperity (Costanza et al., 1997; Fisher et al., 2009).

Mitigating negative influences on ecosystems but also adapting to a changing climate are crucial for the long-term preservation of ecosystem services. Especially in areas where human activity meets vulnerable natural habitats, the protection of the environment while maintaining economic development poses a serious challenge for conservationists as well as policy makers. Central Europe is strongly affected by this challenge as biodiversity is at a worrying state, conservation efforts are insufficient, and urgent actions are needed to strengthen Europe's resilience to climate change. According to the European Environment Agency, only 15% of Europe's habitats are in a good conservation status (2020) while several climate risks have already reached critical levels as Europe is the fastest-warming continent in the world (2024). Notably Alpine regions, such as the Alpstein in Switzerland, suffer from over-tourism, pollution, and unsustainable farming, but are also heavily affected by climate change as has been experienced recently through natural disasters and abnormal temperature and weather variations. Finding ways to mitigate risks and adapt to changes is, thus, unavoidable for these regions to conserve

their environmental and economic well-being in the long run.

For that matter, this study aims to develop a potential framework to improve the environmental and economic conservation of the Alpstein region. The goal is to recognize the socioeconomic value of the Alpstein and its services, showcase the economic and environmental benefits of further protecting the area through targeted management, and innovate a winning strategy that engages stakeholders and enables change and adaptation for social good. As such, this study incorporates ecosystem service valuation as well as stakeholder participation methods to develop a case-specific strategy for the Alpstein. In particular, this study applies qualitative research in the form of extensive questionnaire-based, individual interviews with relevant stakeholders. The aim is to assess the qualitative value of the Alpstein's ecosystem services as well as current attitudes towards and challenges for improved ecosystem conservation, as perceived by the region's key stakeholder groups. The study finds that the predominant issues to address are the consisting conflict between the groups *Tourism*, *Environment*, and *Agriculture* as well as the general threat of mass-tourism. A potential solution should improve communication between stakeholders, foster environmental conservation and adaptation, complement existing policies, and have the ability to affect tourists' behavior. The results suggest that the declaration of the Alpstein region to a *Swiss Nature Park* could be a feasible strategy to build a space in which stakeholders collaborate for the greater good of protecting the Alpstein environmentally and economically and taking systematic measures towards climate adaptation.

The upcoming section 2 provides a review of relevant literature while section 3 introduces the case study, i.e., the Alpstein region, followed by an overview of applied research methods in section 4. Section 5 gathers and presents the results of the stakeholder and ecosystem service analysis. The objective is to determine stakeholder priorities and relevant ecosystem services as well as challenges and policy issues. Based on these results, section 6 develops and discusses a politically feasible strategy that benefits both the environment and the economy, illustrates its implications for stakeholders, and outlines the implementation process of the project. Section 7 provides a summary of conclusions. The Appendix A collects additional resources to support the study's findings.

## 2 Literature Review

### Environmental Conservation

Researchers widely agree on the necessity of protecting vulnerable ecosystems to preserve their services and attempt to find ways of effectively providing protection (Monaco et al., 2021). However, only few cases are implemented which is commonly known as the research-implementation gap in environmental conservation (Knight et al., 2008). The implementation of urgent conservation projects often fails due to the lack of effective knowledge transfer and communication between researchers and practitioners (Jarvis et al., 2015; Toomey et al., 2017; Dubois et al., 2020) and the complexity of human-environment interactions (Cash et al., 2006).

The complexity of protecting ecosystems is owed to their public goods' features (Reiss, 2021), implying that they are typically non-marketed. As a consequence, they are generally ignored by public policy. According to Waldron et al. (2020), an expansion of conservation areas to 30% of the earth's surface would generate higher overall output (revenues) than non-expansion. The Millennium Ecosystem Assessment (2005) further emphasizes that the degradation of ecosystem services comes at the cost of substantially diminished benefits that future generations can obtain from them. The assessment further concludes that reversing the degradation of ecosystems while still meeting demand for their services can only be achieved given significant changes in policies and practices that are currently not underway (MA, 2005).

### Ecosystem Service Valuation

Since most of the value (estimation of the worth or importance) ecosystems provide is outside the market (Champ et al., 2017), socioeconomic losses due to over-exploitation of ecosystems are not properly accounted for (De Groot et al., 2012). Ecosystem service valuation is, therefore, a crucial technique to assign a monetary value to non-market goods, improve decision-making, and support institutions for conservation and sustainable ecosystem management (De Groot et al., 2012). MA (2005) defines four distinct categories of ecosystem services that contribute to human well-being: *Provisioning* services, i.e., foods, crops, water, etc.; *Regulating* services, i.e., filtration, carbon storage, pollination, etc.; *Cultural* services, i.e., recreation or spiritual and aesthetic values; and *Supporting* services, i.e., soil formation, photosynthesis etc.

These four categories are largely recognized amongst researchers, although CICES (2012) provides a slightly modified definition, summarizing regulating and supporting services (*Regulating & Maintenance*). With the aim to preserve natural capital to sustain the provision of future flows of ecosystem services, TEEB (2013) proposes an approach to address biodiversity loss. Most importantly, the TEEB Synthesis intends to make nature's values visible, assess the value of ecosystem services and integrate these into the decision-making process, and foster better measurement for better management (2013). Similarly, the System of Environmental-Economic Accounting (SEEA) (2021) provides a comprehensive statistical framework to gather and organize data about habitats and measure ecosystem services.

The valuation methods to be used depend on the type of ecosystem service (following above categories) and on the type of value (use/non-use) provided. Stated preference methods are used to determine people's (hypothetical) willingness to pay to preserve ecosystem services in case non-use values are present, while revealed preference methods measure direct or indirect use values (Mehvar et al., 2018). Market prices, when available, can be used to value ecosystem goods and services and are typically used to assess the use value of provisioning services (TEEB, 2013). According to the TEEB Guidance Manual (2013), it is recommended to follow a set of pre-defined steps when conducting an ecosystem service valuation. After identifying the most relevant ecosystems and their services, selecting the appropriate methods, and assessing the value of the services, policy options with their pros and cons should be outlined and the study results reported. Before this main study phase, however, it is inevitable to conduct consultations on the key policy issues with stakeholders since early and continuous inclusion and participation of stakeholders are integral parts of the success of environmental management (Reed, 2008).

### **Stakeholder Participation**

To ensure a conservation assessment's practical applicability, it must be tailored to the real-world context and the specific socioeconomic system in which it is located (Meffe, 2001; Carpenter and Folke, 2006; Knight et al., 2008). Ostrom (2009) warns that users of [natural] resources will overharvest and potentially destroy a resource unless a coalition of users takes self-organized, preventative measures. However, the motivation of such a coalition to form de-

depends on the perceived long-term benefits of enforcing new rules compared to the perceived costs of this effort (Ostrom, 2009). Furthermore, evidence suggests that initiatives that consciously address dynamic linkages within the socioeconomic system are more successful at (1) assessing problems and (2) finding solutions that are more politically and ecologically sustainable (Cash et al., 2006). By considering more comprehensive information inputs, stakeholder participation can enhance the quality of environmental decisions (Reed, 2008). A stakeholder is ‘any group or individual who can affect or is affected by the achievement of [...] an objective’ (Freeman et al., 2010). To establish a strategy that considers all affected parties and maximizes their perceived long-term net benefits, stakeholders must be assessed and managed systematically (Savage et al., 1991). Heck et al. (2022) demonstrate that stakeholders value ecosystems in different ways and might be affected differently by management initiatives which calls for the inclusion of a broad spectrum of stakeholders. Applying a pluralistic view when identifying stakeholders, mapping real world systems, and assessing valuation modes has proven more effective for environmental protection efforts (Gunton et al., 2022). Yet, listening to stakeholders’ preferences and needs is merely enough. Implementation is more likely to be successful when stakeholders take the lead in driving projects rather than solely participating (Voinov and Bousquet, 2010) or when their participation is firmly embedded within institutions (Richards et al., 2004). Furthermore, Hinson et al. (2022) observe a bias towards the prioritization of ecosystem services with a direct tangible economic benefit, such as food production and tourism. Important to recognize is that conservation is ‘a social process that engages science, not a scientific process that engages society’ (Balmford and Cowling, 2006; Adams and Sandbrook, 2013; Toomey et al., 2017). Hence, there should not be a distinction between those who suggest and those who implement – they should work hand in hand. Furthermore, a recent study by Newig et al. (2023) finds clear indication for improved environmental governance through stakeholders’ participation, following a meta-analysis of 305 case studies. The most comprehensive approaches to date in terms of stakeholder-led development to foster ecosystem service conservation have been successfully applied to several projects in various environments such as Bangladesh (Allan et al., 2022), Monterey Bay, California (Heck et al., 2022), Indonesia (Supangat et al., 2023), Malawi (Chunga et al., 2023), Sept-Îles, Brittany (Schéré et al., 2023), and Ghana (Bayala et al., 2024).

### 3 Case Study

The threat of ecosystem degradation and the lack of conservation efforts is also a continuous challenge in Switzerland. According to the *Swiss Federal Office of the Environment's* most recent biodiversity report, the area, quality, and connectivity of many ecologically valuable habitats in Switzerland have declined sharply since 1900, mostly due to the unsustainable use of natural resources (Gattlen and Klaus, 2023). The Alps are among the most species-rich areas in Switzerland. However, ecosystem service exploitation, tourism, infrastructure, and climate change are negatively affecting alpine habits and endangering biodiversity. The recent extreme weather events, namely floodings, droughts, unusual temperature variations, and the lack of snow in Central Europe, including Switzerland, further exemplify the urgency for adaptive measures. The European Union not only launched the Biodiversity Strategy for 2023 to protect and restore ecosystems and enhance their resilience and provide climate adaptation benefits (European Commission, 2020) but is actively promoting climate adaption through systematic actions in sectors such as energy, infrastructure, and agriculture (European Commission, 2021). Although Switzerland is not an EU-member, it aligns with several EU policies and initiatives through various bilateral agreements, partnerships, and national regulations that mirror EU standards. Especially through cross-border ecosystems like forests, rivers, lakes, and Alpine regions, international and inter-regional collaboration is essential to improve large-scale protection of natural habitats to maintain their biodiversity and ecosystem services in the long term.

One well-suited example that illustrates the trade-off between economic exploitation and conservation efforts is the Alpstein region. The Alpstein is a scenic Alpine massif situated in the northeastern part of Switzerland, primarily in the cantons<sup>1</sup> of Appenzell Innerrhoden (AI) and Ausserrhoden (AR) and partially in St. Gallen (SG). It is geographically bordered by Lake Constance to the north and the Rhine Valley to the east. The mountainous area of the region spans roughly 120km<sup>2</sup>, reaches an altitude of more than 2'500m (Mt. Säntis), and is characterized by a series of majestic mountain peaks, alpine lakes, rivers, forests, and traditional agriculture. With its temperate to highland climate, the Alpstein is host to a variety of alpine wildlife, in-

---

<sup>1</sup> A *canton* is a semi-autonomous administrative division within Switzerland, similar to a state or province in other countries. Switzerland is made up of 26 cantons, each with its own government, constitution, and legal system, granting them a degree of self-governance.

cluding ibex, chamois, marmots, golden eagles, numerous bird species as well as the Alpstein butterfly, an endemic species. The region is also home to a variety of plant species, including alpine flowers, grasses, and mosses. The Alpstein offers excellent opportunities for recreational activities, particularly hiking. There is an extensive network of well-marked trails, supported by a number of cable cars, that cater to different skill levels, ranging from easy walks to challenging mountain climbs, which makes it an attractive destination for both locals and tourists seeking an authentic alpine experience. However, the Alpstein is more than a recreation area. It holds cultural significance, deeply rooted in local customs, traditions, and business practices. Several local companies producing goods like beer, cheese, liquor, and fabric have achieved international recognition by cleverly leveraging their origin in the Alpstein region and capitalizing on its captivating image for their marketing advantage. Besides tourism and business there are additional stakeholders involved in the area, as will be discussed in the following section.

With ongoing investments in accessibility and a significant rise in (social) media attention, this picturesque Alpine massif has become one of Switzerland's most sought-after tourist destinations (Walker, 2023). While the influx of daily visitors has been financially rewarding for the tourism sector<sup>2</sup> and certain local businesses, it has also presented an increasingly pressing challenge for the region. After infrastructure, gastronomy, agriculture, and leisure providers increasingly congested, the local government had to intervene. In early 2023, the cantonal government of Appenzell Innerrhoden (AI) presented its new tourism policy that recognizes the issue of mass tourism and aims to tackle it. In particular, the new policy intends to build up to 5 new hotels within the next 10-15 years and intervene where infrastructure reaches capacity. The latter considers various strategies including the construction of a car park and incentives to use public transport (Kanton Appenzell Innerrhoden, 2023). Although this policy may facilitate the absorption of large tourist inflows, it fails to address the root cause of the issue, which is the overpopulation of the Alpstein region. Especially in areas with high touristic and other economic activities, such as the Alpstein, a holistic consideration of all ecosystem services and extensive stakeholder engagement is essential for conservation efforts to ensure that demand of ecosystem services does not exceed supply (Grêt-Regamey et al., 2012).

---

<sup>2</sup> Tourism contributes 12.8% to the canton's gross domestic product (GDP) and 16.8% to cantonal employment (Kanton Appenzell Innerrhoden, 2023).

## 4 Methodology

The overarching objective of this study is to (a) assess whether the Alpstein region is conservation-worthy and (b) to develop an approach for improved environmental and economic protection of its ecosystem. This section (2) discusses the research methods that are applied to achieve that objective.

### 4.1 Stakeholder Map

In line with the above-described geographic and socioeconomic attributes of the Alpstein region, 6 stakeholder groups can be distinguished – *Tourism, Agriculture, Business, Government, Environment, and Society*.

#### *Tourism*

Tourism is the main economic activity in the Alpstein. Although most tourists are from Switzerland, the Alpstein's popularity has been gradually increasing beyond cantonal and national borders, attracting more tourists from farther away. The canton AI counted more than 1.5 million day-tourists in 2017, of which only 42% are considered local recreation guests, and roughly 300'000 overnight stays (Rieser et al., 2019). The *Cantonal Tourism Associations AI and AR*, respectively, the *Bergwirteverein* that unites all restaurateurs in the mountains, and the *Säntis-Bahnen AG*, as the largest employer in the tourism sector, are the main drivers regarding the touristic offering in the region. These four parties, with their respective *Presidents*, are the dominant figures in the Alpstein and the key initiators of any sort of development.

#### *Agriculture*

Agriculture is an important contributor to the cantonal economies of AI (2021) and AR (2023) and an integral part of the Alpstein economically and culturally. Farmers and hunters are responsible for the cultivation of alps and the nurture of plants and animals in the area. They not only build the basis for commercial use of the Alpstein but enable the production of regional quality products (dairy and game) and are the preservers of local traditions and customs. The *Cantonal Farmers' and Hunters' Associations*, together with the *Cantonal Department of Agriculture and Forestry AI* and the *Department Nature and Wildlife AR*, are at the forefront of political discourse and, thus, represent this group.



### ***Business***

Businesses around the Alpstein benefit from its good reputation as well as its natural attractiveness. The economic contributors in the region – summarized as the Business group and represented by various *Business Owners & Executives* and the *Cantonal Chambers of Commerce* – have a relationship of mutual dependency and benefit with the Alpstein. The region has a history of high-quality (artisanal) manufacturing and regional food and beverage products whose demand is uplifted by tourism. Conversely, it is the popularity of these products and the image they project of the Alpstein region that attract not only visitors but employees.

### ***Government***

The Alpstein is simultaneously a natural, cultural, and economic space which makes it the governments' responsibility to keep these three spaces in harmony. The respective cantonal governments and their departments are, furthermore, the main initiators of large-scale economic and environmental changes. Thus, the *Chief Magistrates* and *Department Heads of Economic Affairs* of the respective three cantons best represent the Alpstein from a governmental perspective.

### ***Environment***

*The Federal Office for the Environment (FOEN)* is the national department responsible for the long-term conservation and sustainable use of natural resources in Switzerland. Multiple acts and ordinances are in place to pursue the objectives of the FOEN (see Appendix for an overview). On a local level, *Environmental Organizations*, such as *ProNatura* and *WWF*, fight for the compliance and enforcement of environmental laws and advocate, together with *Researchers*, for further integration of conservation perspectives in Swiss ecosystems.

### ***Society***

Society, i.e., the citizens that live in and around the Alpstein region, has an inherent interest in economic development and an intact environment in their community surroundings. The trade-off between economic exploitation to generate wealth and environmental protection to generate human well-being can be a significant challenge for societies. Since the scope of this study does not allow for a sufficient representation of the Alpstein region's society, this stakeholder group covers examples of initiatives that address this issue, taken by ambitious community members

in different areas across Switzerland. This group exemplifies experiences from the *Swiss Nature Park Association* and some of their local projects.

## 4.2 Qualitative Research

Following the insights from above the literature review, this study uses a mostly qualitative research approach. The available resources and the scope of this study are not sufficient to conduct an extensive and quantitative ecosystem service valuation and, consequently, won't estimate monetary values of individual services. However, as TEEB (2013) suggests, it is important to, initially, identify the most relevant ecosystem services as well as to conduct consultations on the key (policy) issues with stakeholders. In line with most recent studies focused on stakeholder participation (Allan et al., 2022; Heck et al., 2022; Supangat et al., 2023; Chunga et al., 2023; Schéré et al., 2023; Newig et al., 2023; Bayala et al., 2024), this analysis assesses the qualitative value of the Alpstein's ecosystem services as well as current attitudes towards and challenges for improved ecosystem conservation, as perceived by the region's key stakeholder groups. This approach allows for the development of a potential conservation framework that incorporates ongoing stakeholder engagement to facilitate implementation.

### Data Collection

The data was collected via questionnaire-based, individual interviews between August 2023 and March 2024. In accordance with above stakeholder mapping, the selected key representatives of each group (in italics) were contacted and interviewed throughout multiple stages. In contrast to other larger population surveys, this analysis did not choose interview partners randomly and required sometimes unconventional means. The Alpstein, particularly Appenzell Innerrhoden, is known to be one of the most traditional and conservative regions in Switzerland. Building trust and offering a secure and comfortable environment for the interview partners was, thus, crucial. As such, the interviews were conducted mostly in person and transcribed by hand since some partners insisted on not being recorded and held accountable. Furthermore, it was in some cases necessary to visit a remote farm or hike multiple hours in Alpine terrain to reach a particular interview partner. Thanks to these efforts, 24 (= N) complete responses could be

collected, i.e., 4 responses for each of the 6 stakeholder groups, which resulted in a response rate of 63% (38 initial contacts).

The data collection process, however, was two-fold. Throughout Summer 2023, the initial contact and subsequent conversations were intended to determine whether there was a common interest among stakeholders in further protecting the Alpstein. These connections further helped to build trust and facilitate the analysis. Throughout Winter 2024, these same stakeholders were then interviewed using a standardized questionnaire. The gap between the first and second stage of the interview process further reduced potential biases as answers during peak-season versus low-season may differ. The interview questionnaire contained three main sections (see Appendix for the detailed questionnaire). First, the interviewees were asked to prioritize ecosystem services (given an overview of common ecosystem services<sup>3</sup>) as well as rank their respective economic importance and level of concern regarding each service. Second, the questionnaire collected answers regarding stakeholders' attitude toward the ecosystem and its conservation, including satisfaction levels of current policies and their willingness to adapt. Third, the interviewees were questioned about potential challenges, issues, and conflicts.

### **Data Analysis**

The final sample ( $N = 24$ ) only contains responses of stakeholders that participated in both stages of the process, i.e., the initial contact and the subsequent survey. Due to the size and non-randomness of the study sample, the results of this study are purely qualitative and do not indicate any statistical representation. However, some of the questions allowed for a light statistical analysis and graphical illustration to showcase interviewee responses. The quantitative responses were gathered using an Excel spreadsheet and subsequently processed and analyzed using Python. The explicit and qualitative responses were transcribed from Swiss-German to German by hand and then translated to English using common, publicly accessible software. Because of the small sample size, no further tools were needed to analyze the responses. In the following section, the results of this analysis will be summarized and further examined.

---

<sup>3</sup> The exhibited selection corresponds to the standard definition of ecosystem services according to TEEB (2013) but may not be exhaustive. Please refer to Appendix (A.1) for the detailed list.

## 5 Results

As discussed earlier, biodiversity in Switzerland is in a poor condition. Without increased efforts and locally targeted measures, the long-term provision of ecosystem services cannot be ensured (Gattlen and Klaus, 2023). Hence, this analysis addresses the specific case of the Alpstein and aims to examine the perceived importance of its ecosystem services, determine stakeholders' priorities and key issues, and develop a suitable conservation strategy through stakeholder participation. In correspondence with the questionnaire's structure, this section (5) highlights the outcomes of the stakeholder interviews and is divided in three parts. Appendix A.2 contains additional graphs for illustration.

### 5.1 Ecosystem Services

The first part of the interview contained explicit (keywords) and quantitative (scale) questions in which the respondents were asked to prioritize<sup>4</sup> a selection of ecosystem services and subsequently assign levels of economic importance and environmental concern<sup>5</sup>. Figure 1 below shows which ecosystem services and how frequently they were mentioned by the respondents.

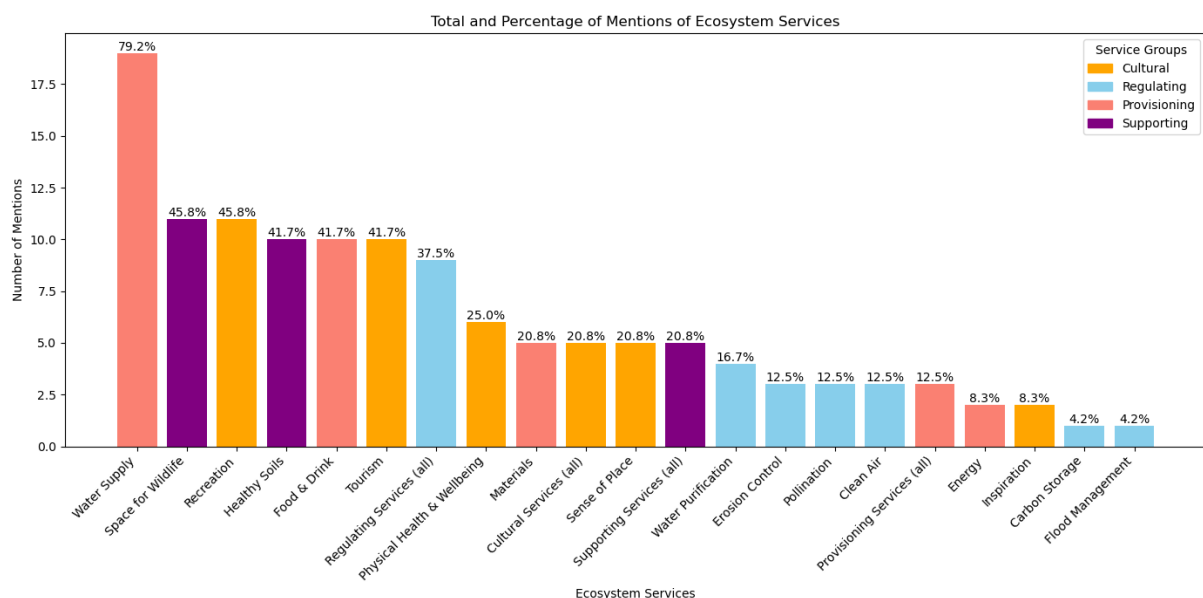


Figure 1: *Total and Percentage of Mentions of Ecosystem Services*

<sup>4</sup> An ecosystem service was assigned the value 1 if it was mentioned by the respondent, and 0 otherwise.

<sup>5</sup> Respondents assigned levels from low (1) to high (5). If a service was not mentioned, it automatically was assigned the value 1.

Clearly, *Water Supply* appears to be the key priority in the Alpstein with almost 80% of respondents mentioning the service. In general, the ‘tangible’ cultural, provisioning, and supporting services appear to be prioritized the most by stakeholders whereas the ‘hidden’ regulating services find themselves at the lower end of the ranking. This, however, is not necessarily owed to the respondents not valuing regulating services. Interestingly, many respondents recognized the importance of this service group but were not able to pinpoint specific services and thus mentioned the whole group. In fact, surprisingly many respondents acknowledged ecosystem services as the outcomes of multiple causal relations in a complex living space and, thus, prioritized all service groups equally. Interesting to understand now is whether respondents prioritize a service because of its economic value or because they are worried about that service. The following Figures 2 and 3 will provide further insights.

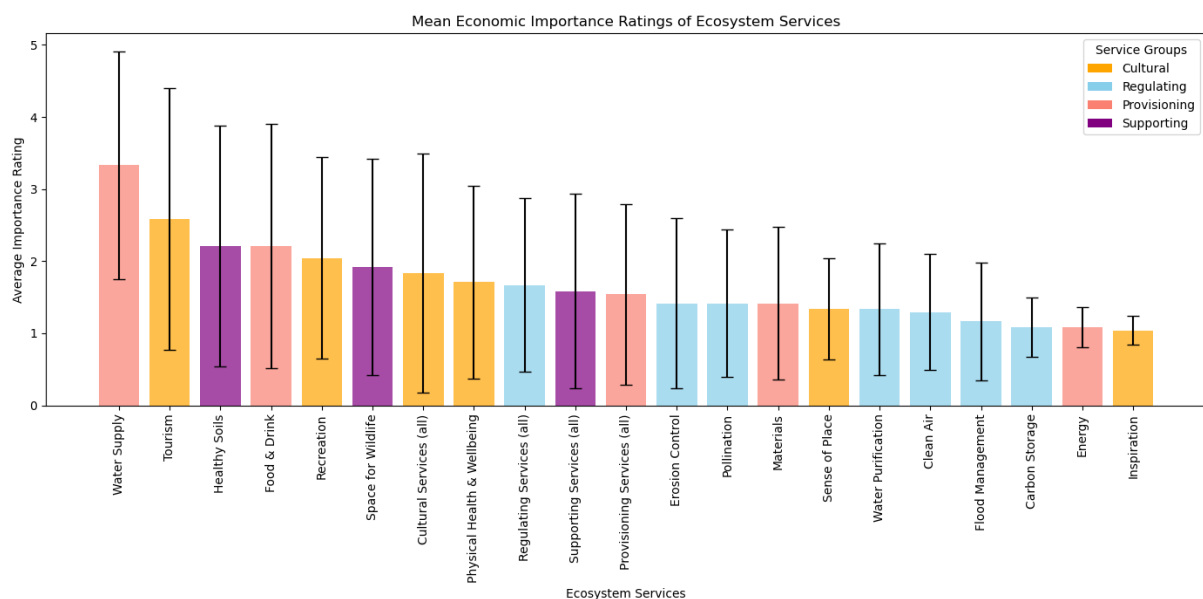


Figure 2: *Mean Economic Importance Ratings of Ecosystem Services*

The economic importance ratings draw a similar picture as above. This does not surprise, considering that all of AI and large parts of AR are supplied by groundwater obtained from multiple springs in and around the Alpstein. The high-quality water is used by households as drinking water and by businesses as a resource for food and beverage products; its contamination would have far-reaching consequences. Additionally, services that are related to agriculture and leisure appear to be significantly valued by stakeholders. *Tourism* and *Recreation*, which

can directly be measured by the economic turnover generated by the tourism sector<sup>6</sup>, and the general cultural value (aesthetics, identification) of the Alpstein were the predominant answers of stakeholder representatives. Furthermore, game and dairy cattle are important food sources with around 400 shot animals per year and roughly 170 alps, with several thousand cows and sheep, that are actively farmed (AI, 2023) alone in the canton AI. In line with the above observations, stakeholders do recognize the importance of *Healthy Soils* and *Space for Wildlife* and understand that for water, timber, and food to be valuable resources, and recreation to be a desirable pursuit in the Alpstein, essential regulating and supporting services must be in a robust state of health and able to function without constraints.

It is common that stakeholders usually value cultural and provisioning services higher than regulating and supporting services because they directly support people's livelihoods and well-being (Lau et al., 2019). However, the findings illustrate the importance of maintaining the ecosystem's health through active conservation, as stakeholders' concerns are mostly focused on regulating and supporting services, recognizing the vulnerability of soil and wildlife.

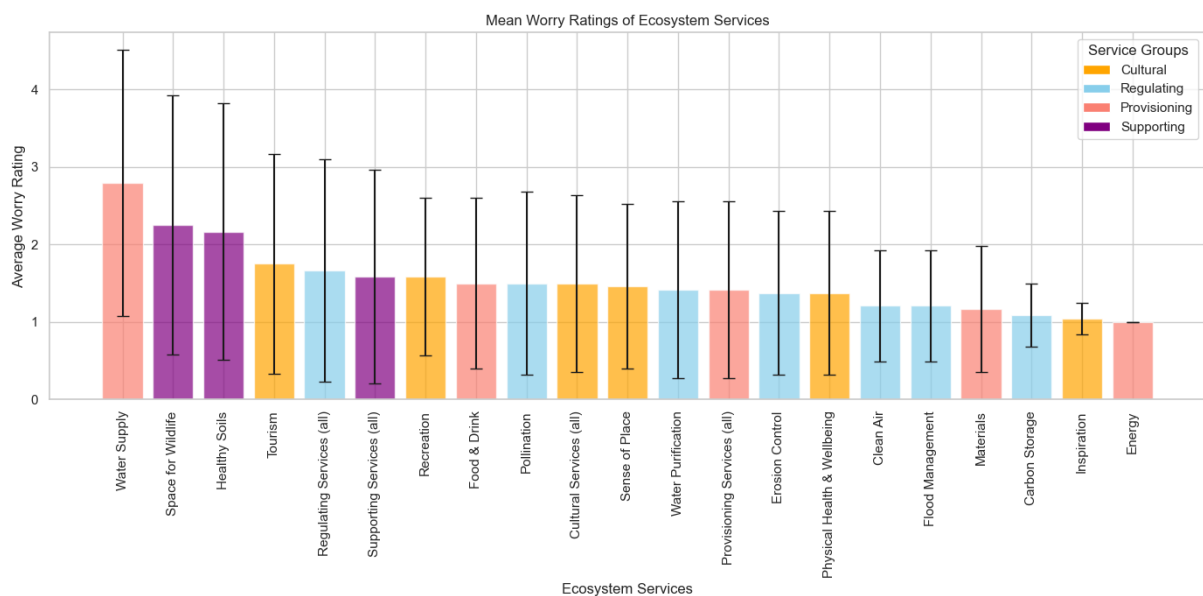


Figure 3: *Mean Worry Ratings of Ecosystem Services*

Interestingly, as the above illustration shows, stakeholders are also concerned about tourism and recreation. This result highlights the interconnectedness and co-dependency of ecosystems

<sup>6</sup> 124 Mio. CHF gross value added directly and indirectly through tourism in 2017. 12.8% share on cantonal GDP and 16.8% share on cantonal employment (Rieser et al., 2019).

and their services. If a natural area is becoming increasingly unhealthy and in danger, it also loses its cultural attractiveness and, thus, its recreational value is impaired. The respondents consider the following points as the main drivers that affect ecosystem services which could be the reasons for stakeholders' concerns:

- Overtourism (accelerated by strong social media presence)
- Human behavior (no respect for nature, traditions, and customs)
- Agriculture (intensive practices and increasing space demand)
- Politics (non-action and short-term thinking)
- Climate Change (weather extremes, loss of biodiversity)

## 5.2 Attitude

This second part of the analysis covers the stakeholders' general attitude towards the Alpstein and its conservation. The aim is to better understand what stakeholders really care about and how they feel regarding current policies. The questionnaire further addressed how easy stakeholders think it would be to protect ecosystem services through active management and how willing they are to adapt to policy changes.

According to the interviews' qualitative responses, all stakeholders agree that the Alpstein region should remain a space where people can visit, live, be active, and do business. It is, furthermore, undisputed that the ecosystem must be conserved, and the region not unnecessarily expanded to attract more tourists. Maintaining the Alpstein's attractiveness is not only crucial for the stakeholders that directly benefit economically, but also for the local society and surrounding businesses that benefit indirectly through identification and quality of life. Although stakeholders seem to agree on the need for conservation, there are large discrepancies in terms of the extent of which the Alpstein should be conserved. This misalignment is reflected in the stakeholders' policy responses <sup>7</sup> (Table 1; further graphs in Appendix A.2) depicted below. Although, on average, the ratings for policy satisfaction, ease of ecosystem service management,

---

<sup>7</sup> Respondents assigned levels from low (1) to high (5). Abstentions were excluded from the analysis.

and willingness to adapt are relatively high, a number of responses regarding policy satisfaction are considerably low. Furthermore, most stakeholders considered it relatively easy to protect ecosystem service through active management. However, when asked about their willingness to adapt to new measures, the average ratings decreased. These results raise a dilemma and reflect a common challenge in the field of conservation: People want more sustainability but may hesitate to live it.

Table 1: Descriptive Statistics of Policy Responses

	Policy Satisfaction Level	Policy Ease Level	Adaptation Will
count	21.00	24.00	24.00
mean	3.24	3.79	3.46
std	1.04	0.72	0.72
min	1.00	3.00	2.00
25%	3.00	3.00	3.00
50%	3.00	4.00	3.50
75%	4.00	4.00	4.00
max	5.00	5.00	5.00

### 5.3 Challenges

As above results showed, stakeholders do recognize the need for improved environmental and economic protection in the case of overexploitation of ecosystem services. However, for the Alpstein region, some representatives argue that the threshold of overexploitation, mainly through tourism and agriculture, is not reached yet. This lack of consensus creates significant challenges for the region and is reflected by the clashing, triangular relationship *Agriculture-Environment-Tourism*, as the predominant cause of most political discussions regarding the Alpstein. According to stakeholders, the key issues resulting from these triangular dynamics materialize as an overpopulation of certain touristic hotspots, traffic, misbehavior and ignorance of visitors, and a long-term loss of local wildlife, biodiversity, traditions, and natives' identification with the area. Furthermore, it is claimed that agriculture is practiced too intensively and increasingly commercially, and that the sector's demand for space hinders not only the touristic offering but the preservation of natural habitats. In contrast, economically active



parties in the Alpstein feel restricted in their freedom of doing business while environmental organizations have experienced major resistance and only limited success in their activities due to strong lobbyism from opposing sides. Meanwhile, the local governments try to accommodate all stakeholders' concerns and reported that the increase in regulations and administrative work has made it challenging to develop goal-oriented and pragmatic policies.

The disputes among the various stakeholders have reached a point where unbiased conversations are almost impossible. Although all stakeholders deeply care about the Alpstein and acknowledge long-term conservation needs, the urgency and means to act are contested. Whether overexploitation is far, close, or already passed, it is important to have policies in place that address its consequences and work towards the adaptation to potential climate changes and risk. If increasingly more tourists visit the Alpstein and cause infrastructure, i.e., restaurants, trails, railways, roads, parking facilities, etc., to repeatedly reach capacity, the interference with the natural and agricultural environment will increase inevitably. Similarly, as climate risks increase and natural disasters and abnormal weather changes become more common, an Alpine region such as the Alpstein must take systematic actions to maintain socioeconomic well-being.

Considering stakeholders' perspectives in terms of their priorities, concerns, attitudes, and challenges is crucial when developing conservation strategies. Thus, the issues that a potential conservation strategy must tackle are predominantly the consisting conflict between *Tourism*, *Environment*, and *Agriculture* as well as the general threat of mass-tourism. In particular, the strategy must address the overpopulation of touristic hotspots and their potential propagation, traffic and parking issues caused by high-frequented day-tourism, misbehavior and ignorance of visitors which includes waste management and safety measures, and the impending losses of local customs and traditions. Furthermore, some internal and external requirements are expected to be met by the suggested strategy. It should improve communication among stakeholders, foster environmental conservation and climate adaptation, and follow a bottom-up approach. For political feasibility, the strategy should complement existing policies, avoid further unnecessary inflation of government structures, and be financially self-sustaining. The remainder of this study will, therefore, focus on a potential framework that is based on the collected insights, complements existing policies, and considers the implications for all affected parties.

## 6 Discussion

The above ecosystem service analysis and stakeholder participation process established a clear understanding of the requirements towards successful conservation. A ‘winning strategy’ addresses climate mitigation as well as adaptation and engages the different stakeholders to introduce the required changes for social good. This section (6) covers the strategy development, i.e., a potential conservation framework (subsection 6.1) including its implications for stakeholders (subsection 6.2), as well as the implementation of the project (subsection 6.3).

### 6.1 Potential Conservation Framework

#### Objective

Considering the above results, the objective of the suggested strategy is to add an additional pillar to the already existing cantonal tourism policy with a specific focus on the environmental and economic protection of the Alpstein ecosystem. As described earlier, the tourism policy targets five distinct pillars: day-tourism, agriculture, accommodation, off-season, and village center. However, it does not address the root cause of the prevalent issues – the touristic situation in the Alpstein. Although the policy recognizes the environmental and socioeconomic issues associated with the current trajectory of tourism in the region, it does not suggest any measures that could affect touristic behavior and environmental conservation in the Alpstein – the main tourist attraction. Instead, it aims to fight the symptoms of overpopulation by creating more expensive parking lots and investing in premium tourism, essentially attracting another set of tourists without first addressing the ones that have been causing the issues. Therefore, an additional pillar complementing governmental measures is needed to ensure the environmental and economic sustainability of the Alpstein itself.

The new ‘Alpstein pillar’ should be detached from governmental structures and responsibilities and instead be a collective of stakeholder representatives that commits to the long-term environmental and economic protection of the Alpstein. Acting as an association under Art. 60-79 of the Swiss Civil Code, this group of decision-makers and experts in their respective fields should work towards declaring the region to a *Swiss Nature Park*, i.e., a ‘regional park of national importance’ that preserves the cultural and natural landscape and promotes a sus-

tainable economy in the region (see Appendix for details). Bringing all stakeholders together and making them responsible for the future of the region is a bottom-up approach that facilitates communication among stakeholders and guarantees that all relevant perspectives are included. Following numerous exchanges with representatives from already existing parks in Switzerland as well as the *Swiss Nature Park Association* and the *Federal Office for the Environment*, a nature park is the ideal vehicle to build a space in which stakeholders collaborate for the greater good of protecting the Alpstein region environmentally and economically and taking systematic measures towards climate adaptation.

## Organization

Figure 4 below illustrates how the ‘*Association Nature Park Alpstein*’ could be organized and what purpose it could follow.

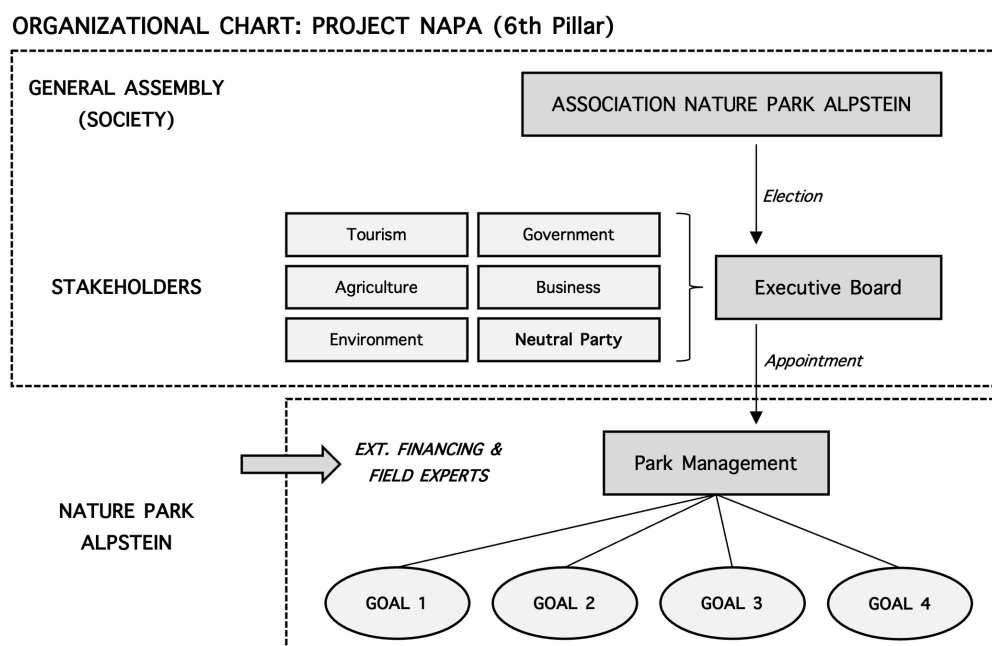


Figure 4: *Organizational Structure, Project Nature Park Alpstein*

The general assembly is the association’s principal decision-making body. It is comprised of individuals from the region’s communes and its main tasks include the adoption and amendment of provisions and regulations, the approval of annual reports and finances, and the election of the association’s president and board. The board is the executive body of the association and is responsible for the management and supervision of the association’s interests. To guarantee

adequate representation of stakeholders, the association's statutes must decree that the board always contains at least one representative of each of the stakeholder groups, *Tourism, Agriculture, Environment, Government, and Business*. Furthermore, the political regions, namely AI, AR, and SG, must be represented effectively. In addition, an external party should serve as a *Neutral Member* that facilitates and enables constructive discourse in the association's board.

As the executive body, the board appoints a management team that has the operational responsibility over the *Nature Park Alpstein* and works towards implementing particular measures and projects that pursue the park's main goals. The park management should, further, collaborate with external experts and secure the park's financing. Financial resources are secured through governmental and cantonal funding (guaranteed contributions to all Swiss nature parks by law), donations, potential membership fees, and other revenues that the nature park generates. The inclusion of experts is an important requirement for the successful long-term conservation of an ecosystem. Neither the management team nor the board is expected to possess precise knowledge of the optimal measures required to effectively conserve an area's environment and economy. However, it is their duty to resort to external practitioners and collaborate with experts to apply the most effective methods to protect vulnerable species, foster sustainable agriculture, and develop economic strategies that align with the association's interests.

## Measures

The *Nature Park Alpstein* commits to four foundational goals:

1. Improve the environmental protection and climate adaptation of the Alpstein.
2. Sustainably integrate the sectors *Tourism, Agriculture, and Environment*.
3. Regulate and preserve the long-term use of ecosystem services.
4. Shape the Alpstein's public perception and tourists' behavior.

The declaration of a nature park builds the foundation for achieving these objectives. (1) Receiving the label 'park of national importance' requires an increased commitment to environmental and economic conservation and adaptation and builds the right setting to take improved

actions. (2) The organizational structure of the *Association Nature Park Alpstein* requires representatives of *Tourism*, *Agriculture*, and the *Environment* to collaborate and develop mutually beneficial strategies. (3) Uniting the entire Alpstein and recognizing it as one interconnected ecosystem allows for better regulation, protection, adaptation. (4) A nature park is generally perceived as a vulnerable environment that requires conservation - this change in perception will positively affect tourists' awareness and respectful behavior.

Within the four baskets, additional and more specific measures should then be defined by the board and park management in consultation with respective experts; especially regarding innovations in agriculture and environmental protection. Depending on future developments, different escalation stages should be considered in order to pursue the foundational objectives. For example, if the proposed measures suggested by the cantonal tourism policy show to be insufficient to regulate tourist inflows, the park should consider a system that controls access through quotas or entry tickets, as suggested by interview partners. Furthermore, park patrolling rangers can be appointed to inform and educate visitors and enforce park rules if necessary.

## 6.2 Implications for Stakeholders

For conservation and adaptation efforts to be successful, participants must recognize clear benefits aligned with their own interests.

*Tourism* is undeniably the major contributor to the exploitation of ecosystem services and, thus, the main target of environmental conservation initiatives in the region. The sector will continue to be the target unless it starts recognizing the importance of further conserving but also adapting to a changing environment. A nature park is the ideal format for the tourism sector to improve communication with other representatives, conserve its most valuable asset, foster quality over quantity, and capitalize on the environmental sustainability the Alpstein region would achieve long-term.

*Agriculture* is confronted with the immediate consequences of overpopulation and climate risks. Thus, a nature park allows for stricter rules for misbehaving tourists and a more effective exchange with other stakeholder groups to foster consensus finding. Furthermore, it creates an environment in which the agriculture sector can assume more responsibility and potentially

benefit from increased financing towards innovation and climate adaptation.

The *Business* group prioritizes quality in terms of the ecosystem services it uses, the relationships it cultivates with other sector, the lifestyle it can offer employees, and the reputation of the Alpstein it benefits from. A nature park magnifies these aspects as its main purpose is environmental and economic promotion – a framework in which conservation, adaptation, and profitability do not contradict each other but create attractive investment opportunities.

*Society* is usually underrepresented in the conversation about the use of natural capital. Unless a project is bound to an initiative or referendum and thus requires a vote by the local population, decisions are usually made by the tourism, agriculture, and governmental sectors. An association overseeing the Alpstein nature park would allow citizens through a membership to become decision makers too and have a direct say in the destiny of the region. Furthermore, the bottom-up approach makes the local population not just the executors but the leaders of the initiative which is essential for the longevity of such conservation efforts.

A nature park association would be a facilitator for the *Government* group in two ways. First, it combines and harmonizes economic promotion and environmental protection – two essential government duties. Second, it alleviates the bureaucratic burden and shifts accountability to encompass all stakeholder groups. Furthermore, financial support from the federal government could enable larger development projects that otherwise would exceed cantonal budgets.

Due to the legal structure of a nature park, the *Environment* of a region is not necessarily better off than without the label; a nature park is not bound to more or stricter protection laws. However, in an area with a lot of economic activity, such as the Alpstein, a nature park pushes ecosystem services further into the decision-making process. An explicit commitment to environmental protection is, thus, a considerable success as it makes nature a priority and conservation and adaptation a strategy.

### 6.3 Project Implementation

Key learnings from various conservation projects suggest that the success of conservation efforts largely depends on the initial set-up and long-term management of the initiative (Muhumuza and Balkwill, 2013). Therefore, it is crucial to tailor a conservation strategy to

each specific case and keep it independent to avoid potential conflicts of interest (Tran et al., 2020). Furthermore, success is more likely if projects are stakeholder-based, i.e., led by the local community (Maxwell et al., 2020), and ideally self-sustaining, meaning that the project incorporates business practices that allow it to be financially sustainable without significant external contribution (Sirimorok and Rusdianto, 2020; Mills et al., 2019).

The suggested strategy for the Alpstein case not only incorporates these learnings but is structured in a way that the project is ready for implementation. In fact, this thesis serves as a pre-feasibility study for the future process of declaring the Alpstein to a Swiss nature park. Following the Swiss Ordinance on Parks of National Importance (Swiss Federal Council, 2007) as well as the guidelines from the *Federal Office for the Environment* (2023), the process of creating a park lasts several years and takes place in three stages: (1) clarification of feasibility including management plan development; (2) establishment including implementation of planned measures and ‘charta’ development; (3) operation and quality assurance (see Appendix A.3 for details). The initial feasibility study and management plan is an extensive process that is usually executed by a third party and subsequently audited by the *Federal Office for the Environment*. This thesis facilitates the initiation of this process, as it highlights the fulfillment of the pre-requirements for a ‘park of national importance’ (see Appendix A.3 for details):

Table 2: Pre-Requirements for Regional Nature Parks

Requirement	Status
Protection Area > 100 km <sup>2</sup>	Given (see map in appendix)
High cultural, natural, and landscape values	Given (see map in appendix)
Low impairment due to infrastructure and exploitation	Further analysis needed
Long-term (democratic) protection commitment	Under development
Ownership and professional management	Given (see Section 4.1)

Having demonstrated the potential and feasibility of improved environmental and economic protection of the Alpstein region, the further aim is to effectively bridge the research-implementation gap. Thus, as next steps, the formation of above-explained association must be targeted by leveraging the relationships with the represented stakeholders, and the further stages initiated, in collaboration with the *Federal Office for the Environment*. Due to the limited scope of this study, these steps shall be taken by the author in private mission.

## 7 Conclusion

This thesis addresses the economic challenges of the overexploitation of ecosystem services and the research-implementation gap in conservation efforts. The former implies a dilemma that requires policymakers and practitioners to find innovative approaches to preserve natural capital. The latter entails communication issues between science and politics due to the lack of stakeholder participation and accountability of ecosystem service values. As other European countries, Switzerland is challenged by overexploitation and climate risk and is heavily exposed to ecosystem degradation and biodiversity loss. Thus, the motives of this thesis are to assess the environmental and economic implications of improved ecosystem protection and to establish a potential conservation framework for the specific case of the Alpstein region – one of Switzerland's Alpine areas most affected by mass-tourism.

The Alpstein case was assessed through independent, qualitative research, i.e., the conduction of 20+ in-person interviews with stakeholder representatives, to evaluate ecosystem services and incorporate stakeholder participation. Throughout the extensive interview process, the relevant stakeholder groups (*Tourism, Agriculture, Business, Society, Government, and Environment*) prioritized ecosystem services, expressed their respective interests, concerns, and expectations, and discussed ongoing political challenges. In sum, the predominant issues to address are the consisting conflict between the groups *Tourism, Environment, and Agriculture* as well as the general threat of mass-tourism. A potential solution should improve communication between stakeholders, foster environmental conservation, follow a bottom-up approach, complement existing policies, avoid further inflation of government structures, be financially self-sustaining, and have the ability to affect tourists' behavior. The suggested strategy moving forward is the founding of an *Association Nature Park Alpstein* which consists of representatives of all relevant stakeholder groups and has the assignment to declare the Alpstein region an official nature park under Swiss regulation. Its objective is to improve the environmental protection and climate adaptation of the Alpstein ecosystem, sustainably integrate tourism, agriculture, and environment, regulate and preserve the long-term use of ecosystem services, and shape the Alpstein's public perception and tourists' behavior. The specific measures to achieve the above objectives are to be defined by the association's board under consultation with external experts



and practitioners. The suggested strategy builds a framework that actively includes all relevant perspectives and allows local stakeholders to take responsibility for protecting not only their precious environment but their livelihoods. Furthermore, the chosen approach can serve as an inspiration for fellow researchers to shift from solely recommending to actively seeking implementation of conservation efforts.

The main limitations of this study are the lack of an explicit quantification of ecosystem services and monitoring strategy of the project's implementation success. Both aspects are beyond the scope and capacity of this study. First, an explicit valuation of the Alpstein's ecosystem services is an extensive process that usually requires larger teams of researchers from, ideally, different academic fields. Second, the time horizon of this M.Sc. thesis was insufficient to conduct a long-term study that monitors all stages from research to implementation. Hence, further research and learnings from real, long-term cases that apply participatory conservation approaches are much needed. Furthermore, a quantitative ecosystem service valuation for the Alpstein region would be a valued addition that could be approached by future studies. In general, trade-offs between environmental protection and economic exploitation should be further analyzed, stakeholder dynamics such as the conflicts between agriculture, tourism, and the environment better understood, and climate adaptation measures increasingly developed.

Although this thesis finds an end with the suggestion of a feasible strategy, the process for the Alpstein case is not complete yet. As such, the next steps are to present the findings and suggestions of this thesis to the stakeholder representatives and move forward with its implementation. These steps will be tackled autonomously and in private mission of the author. Through the founding of *Peak2Shore*, the author intends to drive the *Nature Park Alpstein* forward and act as the neutral party in its association. *Peak2Shore*, furthermore, aims to better understand the clash between economic activity and environmental conservation. Its purpose is to develop and implement projects to conserve vulnerable ecosystems while enabling economic development in order to further close the research-implementation gap and make environments and societies prosper sustainably. We don't suggest, we initiate. We don't demand, we deliver.

## References

- Adams, W. M., & Sandbrook, C. (2013). Conservation, evidence and policy. *Oryx*, 47(3), 329–335. <https://doi.org/10.1017/S0030605312001470>
- Allan, A., Barbour, E., Nicholls, R. J., Hutton, C., Lim, M., Salehin, M., & Rahman, M. M. (2022). Developing socio-ecological scenarios: A participatory process for engaging stakeholders. *Science of The Total Environment*, 807, 150512. <https://doi.org/10.1016/j.scitotenv.2021.150512>
- Balmford, A., & Cowling, R. M. (2006). Fusion or Failure? The Future of Conservation Biology. *Conservation Biology*, 20(3), 692–695. <https://www.jstor.org/stable/3879233>
- Bayala, E. R. C., Ros-Tonen, M., Yanou, M. P., Djoudi, H., Reed, J., & Sunderland, T. (2024). Towards more inclusive community landscape governance: Drivers and assessment indicators in northern ghana. *Forest Policy and Economics*, 159, 103138. <https://doi.org/https://doi.org/10.1016/j.forpol.2023.103138>
- Bundesamt für Umwelt (BAFU). (2023). Anforderungen, Errichtung und Betrieb von Parks. <https://www.bafu.admin.ch/bafu/de/home/themen/landschaft/fachinformationen/landschaften-nationaler-bedeutung/paerke-von-nationaler-bedeutung/anforderungen--errichtung-und-betrieb-von-paerken.html>
- Carpenter, S. R., & Folke, C. (2006). Ecology for transformation. *Trends in Ecology & Evolution*, 21(6), 309–315. <https://doi.org/10.1016/j.tree.2006.02.007>
- Cash, D. W., Adger, W. N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L., & Young, O. (2006). Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel World. *Ecology and Society*, 11(2), art8. <https://doi.org/10.5751/ES-01759-110208>
- Champ, P. A., Boyle, K. J., & Brown, T. C. (Eds.). (2017). *A Primer on Nonmarket Valuation* (Vol. 13). Springer Netherlands. <https://doi.org/10.1007/978-94-007-7104-8>

- Chunga, B. A., Graves, A., & Knox, J. W. (2023). Evaluating barriers to effective rural stakeholder engagement in catchment management in malawi. *Environmental Science & Policy*, 147, 138–146. <https://doi.org/10.1016/j.envsci.2023.06.006>
- Costanza, R., d’Arge, R., De Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O’neill, R. V., Paruelo, J., et al. (1997). The value of the world’s ecosystem services and natural capital. *nature*, 387(6630), 253–260.
- De Groot, R., Brander, L., Van Der Ploeg, S., Costanza, R., Bernard, F., Braat, L., Christie, M., Crossman, N., Ghermandi, A., Hein, L., Hussain, S., Kumar, P., McVittie, A., Portela, R., Rodriguez, L. C., Ten Brink, P., & Van Beukering, P. (2012). Global estimates of the value of ecosystems and their services in monetary units. *Ecosystem Services*, 1(1), 50–61. <https://doi.org/10.1016/j.ecoser.2012.07.005>
- Dubois, N. S., Gomez, A., Carlson, S., & Russell, D. (2020). Bridging the research-implementation gap requires engagement from practitioners. *Conservation Science and Practice*, 2(1), e134. <https://doi.org/10.1111/csp2.134>
- European Commission. (2020). EU Biodiversity Strategy for 2030. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52020DC0380>
- European Commission. (2021). EU Adaptation Strategy. [https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy\\_en](https://climate.ec.europa.eu/eu-action/adaptation-climate-change/eu-adaptation-strategy_en)
- European Environment Agency. (2020). *State of nature in the EU: Results from reporting under the nature directives 2013-2018* (tech. rep.). Publications Office of the European Union, Luxembourg. <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu-2020>
- European Environment Agency. (2024). *European Climate Risk Assessment* (tech. rep.). Publications Office of the European Union, Luxembourg. <https://www.eea.europa.eu/publications/european-climate-risk-assessment>

- Fisher, B., Turner, R. K., & Morling, P. (2009). Defining and classifying ecosystem services for decision making. *Ecological Economics*, 68(3), 643–653. <https://doi.org/10.1016/j.ecolecon.2008.09.014>
- Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & Colle, S. d. (2010, April). *Stakeholder Theory: The State of the Art*. Cambridge University Press.
- Garrett, K. A., Forbes, G. A., Savary, S., Skelsey, P., Sparks, A. H., Valdivia, C., van Bruggen, A. H., Willocquet, L., Djurle, A., Duveiller, E., et al. (2011). Complexity in climate-change impacts: An analytical framework for effects mediated by plant disease. *Plant Pathology*, 60(1), 15–30.
- Gattlen, N., & Klaus, G. (2023). *Biodiversität in der schweiz: Zustand und entwicklung* (tech. rep.). Bundesamt für Umwelt (BAFU). <https://www.bafu.admin.ch/bafu/de/home/themen/biodiversitaet/publikationen-studien/publikationen/biodiversitaet-schweiz-zustand-entwicklung.html>
- Grêt-Regamey, A., Brunner, S. H., & Kienast, F. (2012). Mountain Ecosystem Services: Who Cares? *Mountain Research and Development*, 32(S1). <https://doi.org/10.1659/MRD-JOURNAL-D-10-00115.S1>
- Gunton, R. M., Hejnowicz, A. P., Basden, A., Van Asperen, E. N., Christie, I., Hanson, D. R., & Hartley, S. E. (2022). Valuing beyond economics: A pluralistic evaluation framework for participatory policymaking. *Ecological Economics*, 196, 107420. <https://doi.org/10.1016/j.ecolecon.2022.107420>
- Haines-Young, R., & Potschin, M. (2012). Common international classification of ecosystem services (cices, version 4.1). *European Environment Agency*, 33, 107.
- Heck, N., Paytan, A., Potts, D., & Haddad, B. (2022). Variations in stakeholders' ecosystem service priorities for managing a marine protected area. *Marine Policy*, 146, 105330. <https://doi.org/10.1016/j.marpol.2022.105330>

- Hinson, C., O’Keeffe, J., Mijic, A., Bryden, J., Van Grootveld, J., & Collins, A. M. (2022). Using natural capital and ecosystem services to facilitate participatory environmental decision making: Results from a systematic map. *People and Nature*, 4(3), 652–668. <https://doi.org/10.1002/pan3.10317>
- Intergovernmental Panel on Climate Change (IPCC). (2022). *Global Warming of 1.5°C: IPCC Special Report on Impacts of Global Warming of 1.5°C above Pre-industrial Levels in Context of Strengthening Response to Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*. Cambridge University Press. <http://dlib.hust.edu.vn/handle/HUST/21737>
- Jarvis, R. M., Borrelle, S. B., Breen, B. B., & Towns, D. R. (2015). Conservation, mismatch and the research–implementation gap. *Pacific Conservation Biology*, 21(2), 105. <https://doi.org/10.1071/PC14912>
- Kanton Appenzell Ausserrhoden. (2023). *Der Kanton in Zahlen* (tech. rep.). Verwaltung, Kantonskanzlei. <https://ar.ch/verwaltung/kantonskanzlei/kanzleidienste/dienstleistungs-und-materialzentrale/downloadcenter-kantonskanzlei/kanton-und-gemeinden-in-zahlen/der-kanton-in-zahlen/>
- Kanton Appenzell Innerrhoden. (2021). *Unser Innerrhoden in Zahlen* (tech. rep.). Amt für Wirtschaft, Fachstelle Statistik. <https://www.ai.ch/themen/staat-und-recht/statistik>
- Kanton Appenzell Innerrhoden. (2023). *Tourismuspolitik Appenzell I.Rh.* (tech. rep.). Standeskommission, Amt für Wirtschaft. <https://www.ai.ch/themen/wirtschaft-und-arbeit/tourismus/tourismuspolitik>
- Kellogg, W. W. (1983). Feedback mechanisms in the climate system affecting future levels of carbon dioxide. *Journal of Geophysical Research: Oceans*, 88(C2), 1263–1269.
- Knight, A. T., Cowling, R. M., Rouget, M., Balmford, A., Lombard, A. T., & Campbell, B. M. (2008). Knowing But Not Doing: Selecting Priority Conservation Areas and the Research–

- Implementation Gap. *Conservation Biology*, 22(3), 610–617. <https://doi.org/10.1111/j.1523-1739.2008.00914.x>
- Lau, J. D., Hicks, C. C., Gurney, G. G., & Cinner, J. E. (2019). What matters to whom and why? Understanding the importance of coastal ecosystem services in developing coastal communities. *Ecosystem Services*, 35, 219–230. <https://doi.org/10.1016/j.ecoser.2018.12.012>
- Mace, G. M., Norris, K., & Fitter, A. H. (2012). Biodiversity and ecosystem services: A multi-layered relationship. *Trends in Ecology & Evolution*, 27(1), 19–26. <https://doi.org/10.1016/j.tree.2011.08.006>
- Maxwell, S. L., Cazalis, V., Dudley, N., Hoffmann, M., Rodrigues, A. S. L., Stolton, S., Visconti, P., Woodley, S., Kingston, N., Lewis, E., Maron, M., Strassburg, B. B. N., Wenger, A., Jonas, H. D., Venter, O., & Watson, J. E. M. (2020). Area-based conservation in the twenty-first century. *Nature*, 586(7828), 217–227. <https://doi.org/10.1038/s41586-020-2773-z>
- Meffe, G. K. (2001). The Context of Conservation Biology. *Conservation Biology*, 15(4). <https://doi.org/10.1046/j.1523-1739.2001.015004815.x>
- Mehvar, S., Filatova, T., Dastgheib, A., De Ruyter van Steveninck, E., & Ranasinghe, R. (2018). Quantifying Economic Value of Coastal Ecosystem Services: A Review. *Journal of Marine Science and Engineering*, 6(1). <https://doi.org/10.3390/jmse6010005>
- Millennium Ecosystem Assessment (MA). (2005). *Ecosystems and human well-being* (Vol. 5). Island Press Washington, DC.
- Mills, M., Bode, M., Mascia, M. B., Weeks, R., Gelcich, S., Dudley, N., Govan, H., Archibald, C. L., Romero-de-Diego, C., Holden, M., Biggs, D., Glew, L., Naidoo, R., & Possingham, H. P. (2019). How conservation initiatives go to scale. *Nature Sustainability*, 2(10), 935–940. <https://doi.org/10.1038/s41893-019-0384-1>

- Monaco, M. E., Spooner, E., Oakes, S. A., Harvey, C. J., & Kelble, C. R. (2021). Introduction to the NOAA Integrated Ecosystem Assessment Program: Advancing Ecosystem Based Management. *Coastal Management*, 49(1), 1–8. <https://doi.org/10.1080/08920753.2021.1846109>
- Muhumuza, M., & Balkwill, K. (2013). Factors Affecting the Success of Conserving Biodiversity in National Parks: A Review of Case Studies from Africa. *International Journal of Biodiversity*, 2013, e798101. <https://doi.org/10.1155/2013/798101>
- Newig, J., Jager, N. W., Challies, E., & Kochskämper, E. (2023). Does stakeholder participation improve environmental governance? evidence from a meta-analysis of 305 case studies. *Global Environmental Change*, 82, 102705. <https://doi.org/https://doi.org/10.1016/j.gloenvcha.2023.102705>
- Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939), 419–422.
- Reed, M. S. (2008). Stakeholder participation for environmental management: A literature review. *Biological Conservation*, 141(10), 2417–2431. <https://doi.org/10.1016/j.biocon.2008.07.014>
- Reiss, J. (2021). Public Goods. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Fall 2021). Metaphysics Research Lab, Stanford University. <https://plato.stanford.edu/archives/fall2021/entries/public-goods/>
- Richards, C., Carter, C., & Sherlock, K. (2004). *Practical approaches to participation*. Macaulay Institute Aberdeen.
- Rieser, C., Schwehr, T., Rütter-Fischbacher, U., Rütter, H., Hoff, O., Nathani, C., & Hellmüller, P. (2019). *Die Wertschöpfung des Tourismus im Kanton Appenzell Innerrhoden 2017* (tech. rep.). Rütter Sococo, Volkswirtschaftsdepartement Kanton Appenzell Innerrhoden. <https://www.ai.ch/themen/wirtschaft-und-arbeit/tourismus>

- Ripple, W. J., Wolf, C., Lenton, T. M., Gregg, J. W., Natali, S. M., Duffy, P. B., Rockström, J., & Schellnhuber, H. J. (2023). Many risky feedback loops amplify the need for climate action. *One Earth*, 6(2), 86–91.
- Savage, G. T., Nix, T. W., Whitehead, C. J., & Blair, J. D. (1991). Strategies for assessing and managing organizational stakeholders. *Academy of Management Perspectives*, 5(2), 61–75. <https://doi.org/10.5465/ame.1991.4274682>
- Schéré, C. M., Schreckenber, K., Dawson, T. P., Duval, C., Alban, F., Gentil, É. L., & Provost, P. (2023). Examining stakeholder involvement in the context of top-down marine protected area governance: The case of the sept-îles national nature reserve (brittany, france). *Regional Studies in Marine Science*, 67, 103196. <https://doi.org/https://doi.org/10.1016/j.rsma.2023.103196>
- Sirimorok, N., & Rusdianto, E. (2020). Conditions for Success in a Community Based Conservation Initiative: An Analysis of Triggering Moments and Catalytic Elements in Nuha. *Forest and Society*, 4, 127–141. <https://doi.org/10.24259/fs.v4i1.8184>
- Supangat, A. B., Basuki, T. M., Indrajaya, Y., Setiawan, O., Wahyuningrum, N., Purwanto, Putra, P. B., Savitri, E., Indrawati, D. R., Auliyani, D., et al. (2023). Sustainable management for healthy and productive watersheds in indonesia. *Land*, 12(11), 1963. <https://doi.org/10.3390/land12111963>
- Swiss Federal Council. (2007). Ordinance on Parks of National Importance (Parks Ordinance, ParkO). <https://www.fedlex.admin.ch/eli/cc/2007/743/en>
- The Economics of Ecosystems and Biodiversity (TEEB). (2013). *Guidance manual for teeb country studies* (Vol. 1.0). [https://www.teebweb.org/media/2013/10/TEEB\\_GuidanceManual\\_2013\\_1.0.pdf](https://www.teebweb.org/media/2013/10/TEEB_GuidanceManual_2013_1.0.pdf)
- Toomey, A. H., Knight, A. T., & Barlow, J. (2017). Navigating the Space between Research and Implementation in Conservation: Research-implementation spaces. *Conservation Letters*, 10(5), 619–625. <https://doi.org/10.1111/conl.12315>



- Tran, T. C., Ban, N. C., & Bhattacharyya, J. (2020). A review of successes, challenges, and lessons from Indigenous protected and conserved areas. *Biological Conservation*, 241, 108271. <https://doi.org/10.1016/j.biocon.2019.108271>
- United Nations. (2021). *System of Environmental-Economic Accounting–Ecosystem Accounting (SEEA EA)* (tech. rep.). United Nations, Department of Economic and Social Affairs. <https://seea.un.org/es/ecosystem-accounting>
- Voinov, A., & Bousquet, F. (2010). Modelling with stakeholders. *Environmental Modelling & Software*, 25(11), 1268–1281. <https://doi.org/10.1016/j.envsoft.2010.03.007>
- Waldron, A., Adams, V., Allan, J., Arnell, A., Asner, G., Atkinson, S., Baccini, A., Baillie, J., Balmford, A., & Beau, J. A. (2020). Protecting 30% of the planet for nature: Costs, benefits and economic implications.
- Walker, K. (2023). The 11 most incredible places to visit in Switzerland: Be inspired. <https://www.lonelyplanet.com/articles/best-places-to-visit-in-switzerland>

## A Appendix

### A.1 Interviews

#### Ecosystem Services

Table 3: Overview of Ecosystem Services

<b>Cultural Services</b>	<b>Regulating Services</b>
Physical health & mental wellbeing	Clean air
Tourism	Carbon storage
Knowledge and learning	Flood management
Recreation	Erosion control
Sense of place	Water purification
Inspiration	Disease and natural pest control
Spiritual & religious connections	Pollination
<b>Provisioning Services</b>	<b>Supporting Services</b>
Food & Drink	Healthy soils
Natural medicines	Photosynthesis
Water supply	Nutrient cycling
Materials	Space for wildlife
Renewable & non-renewable energy	

#### Questionnaire

##### *Ecosystem Services:*

- Which ecosystem services seem particularly important to the functioning of a given area's society and economy? (explicit)
- How valuable are your prioritized ecosystem services in economic terms? (quantitative,1-5)
- Which services are you most concerned about particularly in the case of depletion or damage to these services? (quantitative,1-5)
- What are the main drivers (including policies and socio-economic developments) that are currently affecting ecosystem services? (explicit)
- How feasible is it to influence the provision and value of ecosystem services through management or policy? (quantitative,1-5)

***Attitude:***

- What is your personal relationship to the Alpstein? (qualitative)
- What intentions/interests/priorities do you follow with regard to the Alpstein? (qualitative)
- How satisfied are you with current policies? (quantitative,1-5)
- Can you think of alternative policy options? (qualitative)
- How willing are you to compromise with regard to new policies? (quantitative,1-5)

***Challenges:***

- What are the current political and societal issues regarding the Alpstein? (qualitative)
- Are there conflicts/common interests among stakeholders? (qualitative)
- What concerns do you have regarding the Alpstein? (qualitative)

## A.2 Graphs

### Economic Importance of Ecosystem Services:

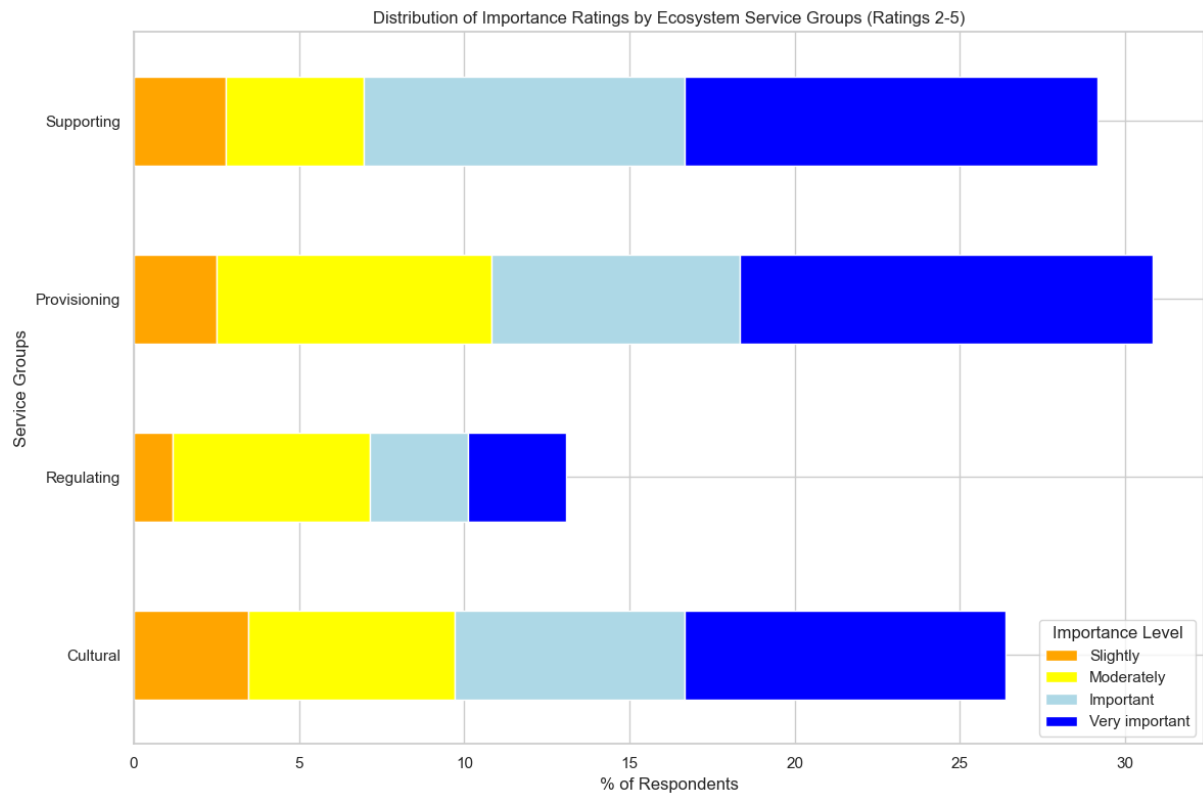


Figure 5: *Distribution of Importance by Ecosystem Service Groups (Ratings 2-5)*

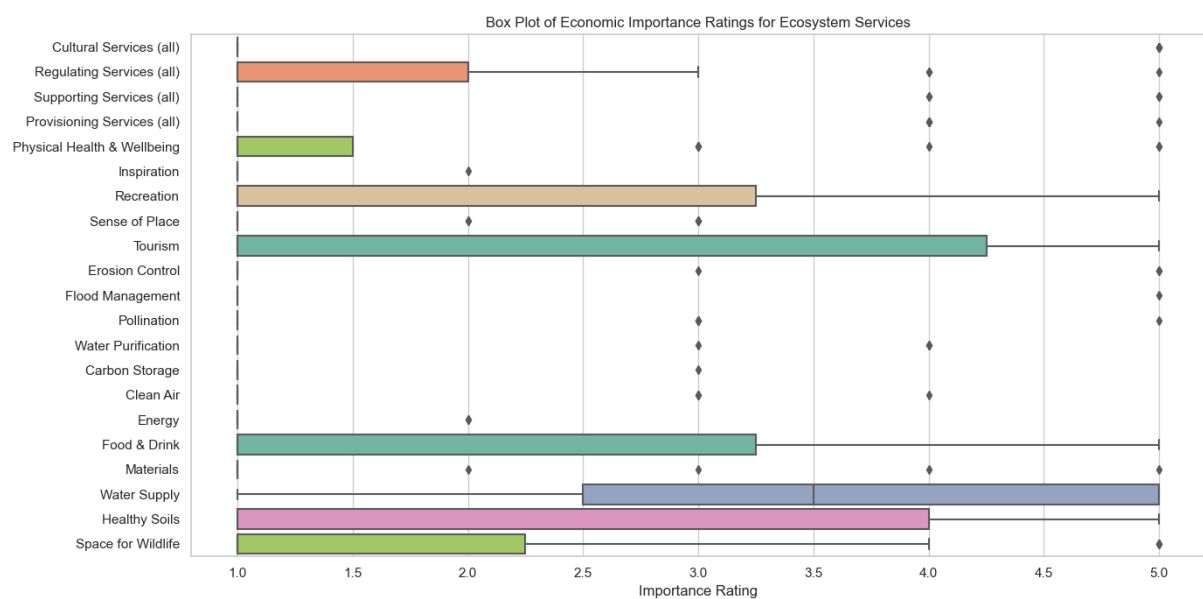


Figure 6: *Box Plot of Economics Importance Ratings for Ecosystem Services*

Top 5 Ecosystem Services Mean Importance Ratings by Stakeholder Group

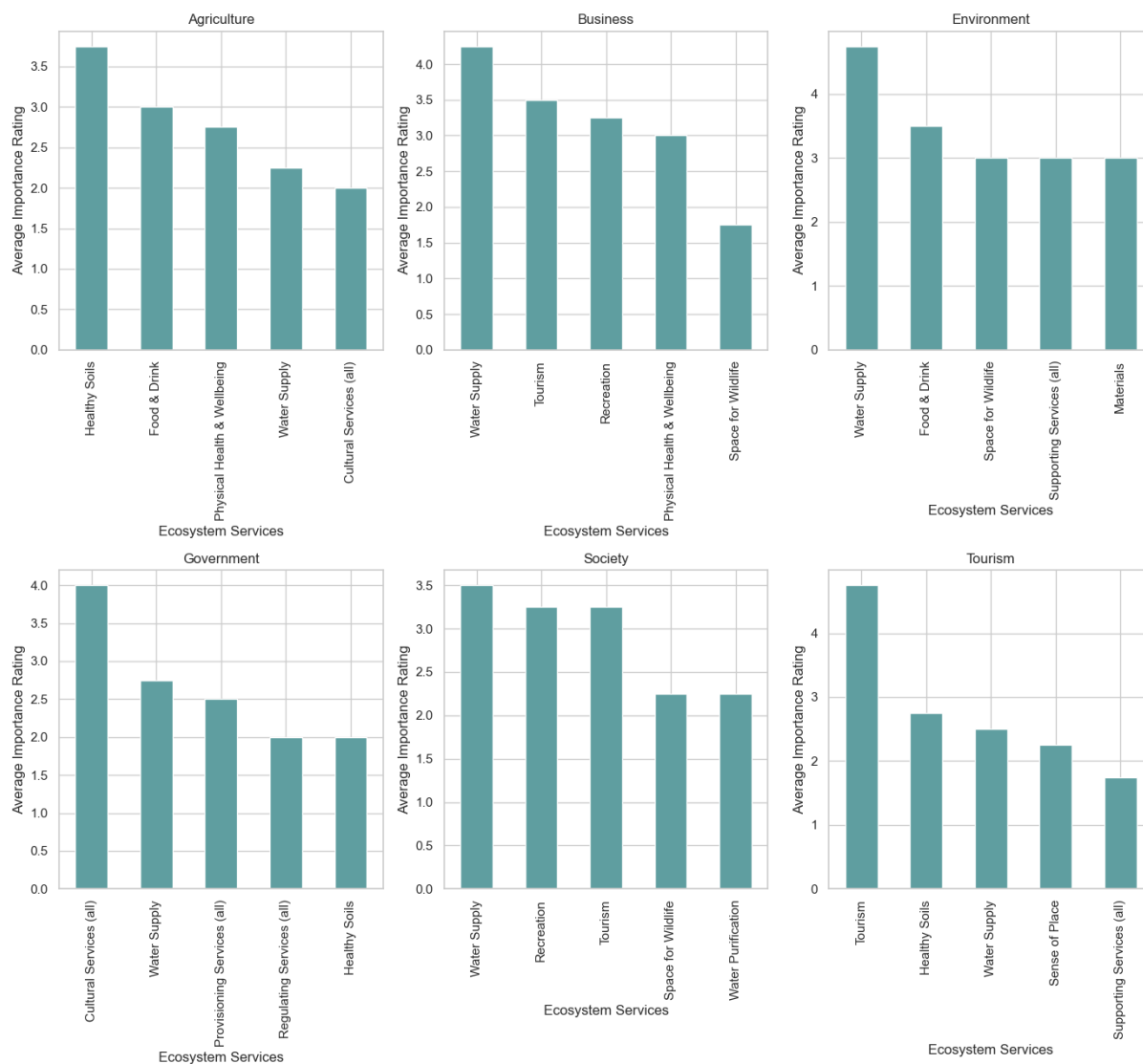


Figure 7: Top 5 Mean Economic Importance Ratings by Stakeholder Group

### Concern Levels regarding Ecosystem Services:

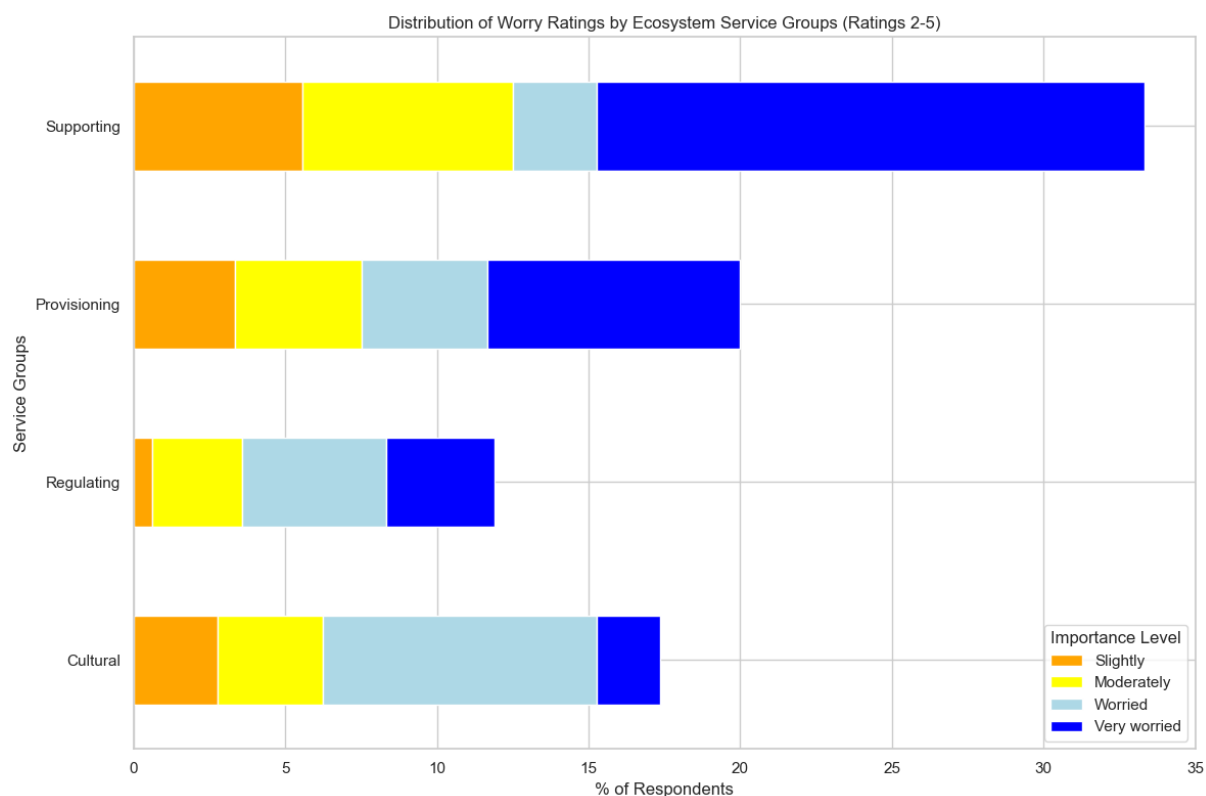


Figure 8: *Distribution of Worry Ratings by Ecosystem Service Groups (Ratings 2-5)*

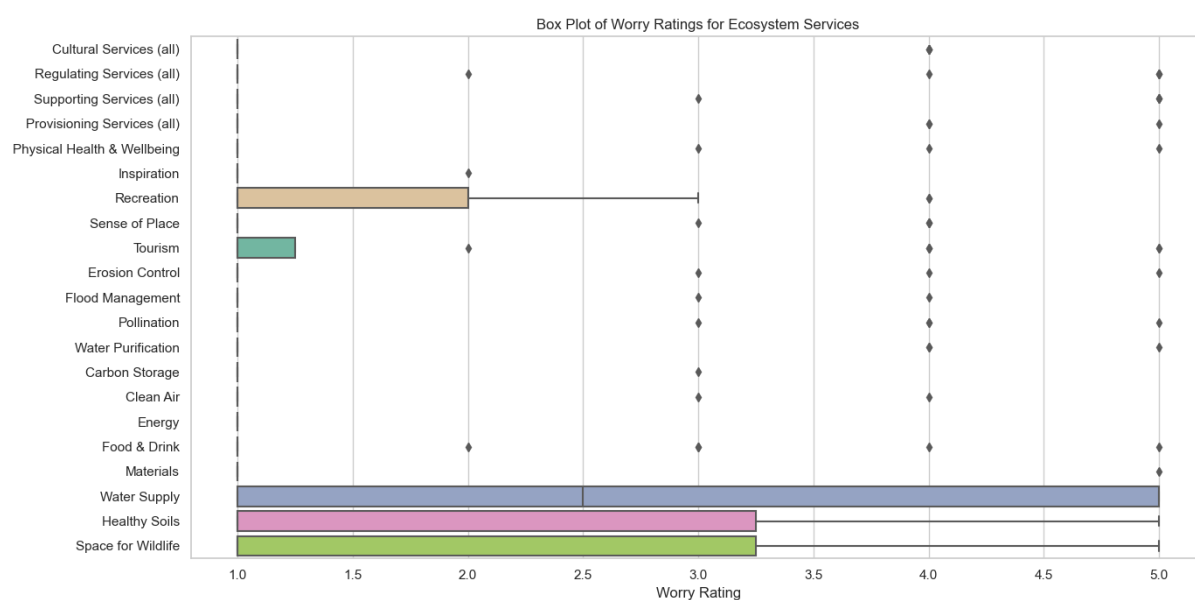


Figure 9: *Box Plot of Worry Ratings for Ecosystem Services*

Top 5 Ecosystem Services Mean Worry Ratings by Stakeholder Group

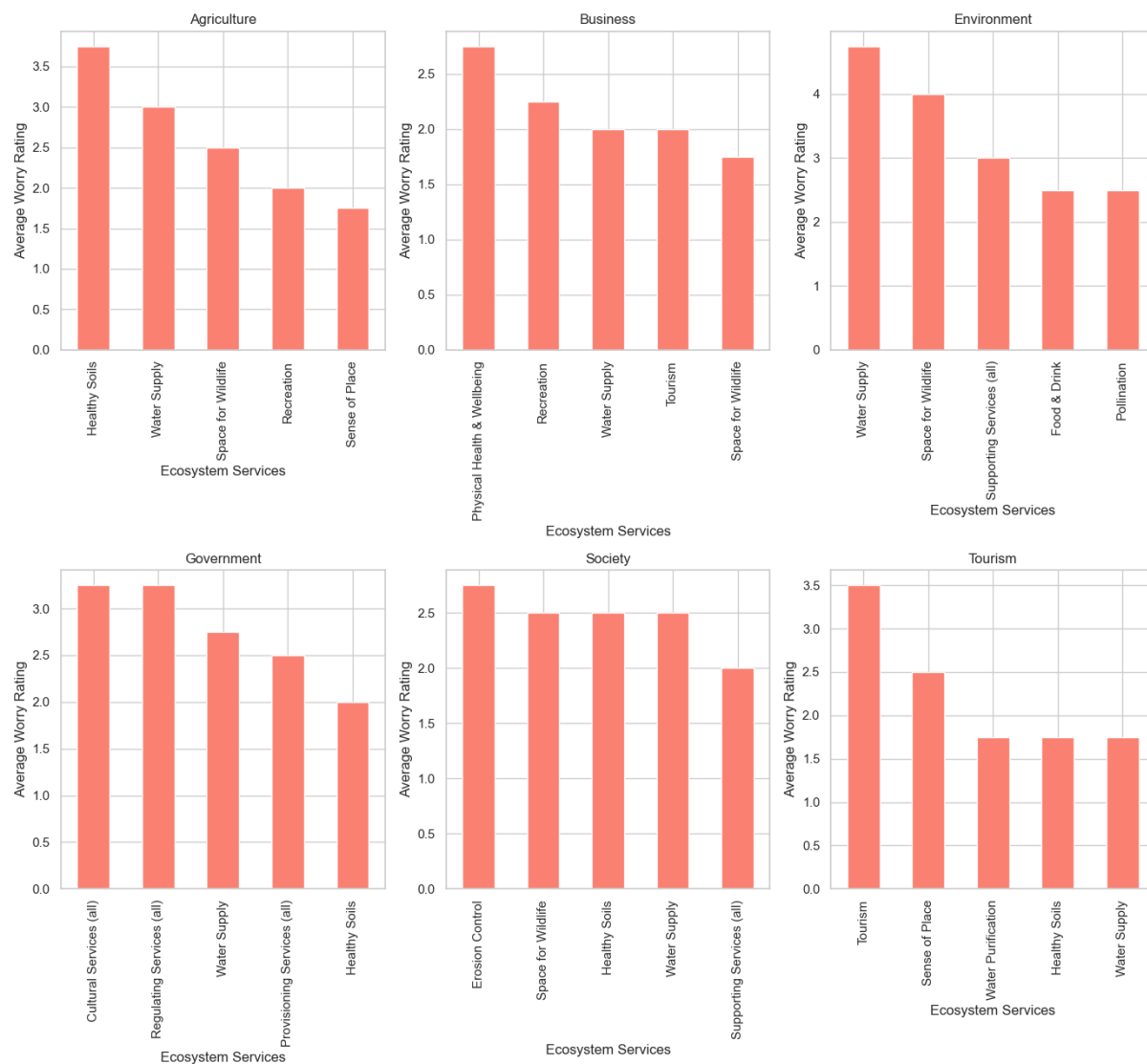
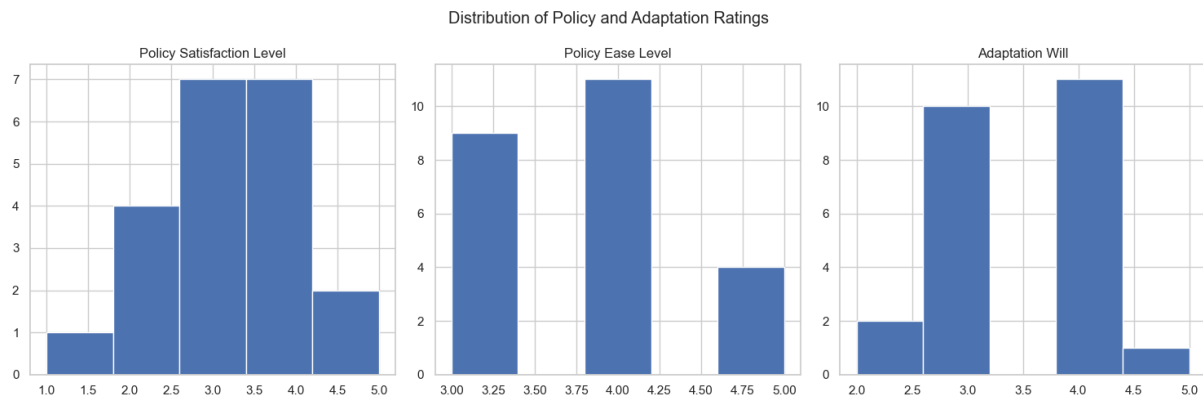
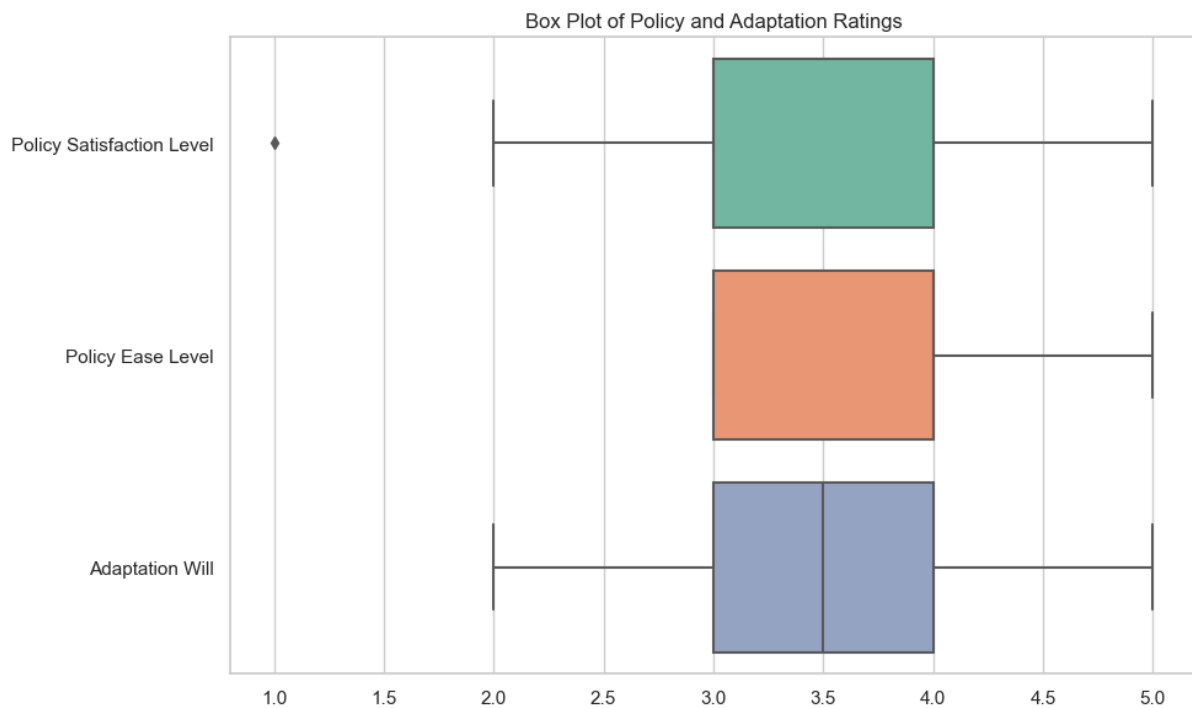


Figure 10: Top 5 Mean Worry Ratings by Stakeholder Group

**Stakeholders' Attitude regarding Conservation Policy:**Figure 11: *Distribution of Policy and Adaptation Ratings*Figure 12: *Box Plot of Policy and Adaptation Ratings*



## A.3 Regulatory Environment

### Federal Legislation & Nature Park Regulations

#### *Art. 78 Federal Constitution: Protection of natural and cultural heritage:*

<sup>1</sup> The cantons are responsible for the protection of nature and cultural heritage.

<sup>2</sup> In fulfilling its duties, the Confederation shall take into account the concerns of nature and cultural heritage protection. It shall protect landscapes, sites, historical sites and natural and cultural monuments; it shall preserve them unimpaired if the public interest so requires.

<sup>3</sup> It may support efforts to protect nature and cultural heritage and acquire or secure objects of national importance by contract or by expropriation.

<sup>4</sup> It shall issue regulations for the protection of flora and fauna and the preservation of their habitats in their natural diversity. It shall protect endangered species from extinction.

<sup>5</sup> Mires and mire landscapes of particular beauty and national importance are protected. No facilities may be built in them, nor may the ground be altered. This does not apply to facilities that serve to protect the moors and moorland landscapes or to their previous agricultural use.

#### *Federal Act on the Protection of Nature and Cultural Heritage (NCHA):*

In 2007, the Federal Parliament passed the legal basis for the creation of new parks in Switzerland. The revised Nature and Cultural Heritage Protection Act (NCHA) came into force on December 1, 2007. In nine new articles (NCHA Art. 23e to 23m), it builds the legal basis for "Parks of National Importance".

According to the NCHA, parks are "areas with high nature and landscape values". There are three categories (national park, regional nature park, nature discovery park). The cantons support efforts to create parks and ensure the participation of the population of the municipalities concerned. The Confederation awards a park the park label. For its part, the sponsoring body of a park can award a product label to products and services. The Confederation grants the cantons global financial assistance for the establishment, operation and quality assurance of parks of national importance.

***Parks Ordinance (ParkO):***

The "Ordinance on Parks of National Importance" of November 7, 2007 (in short: Parks Ordinance) regulates the general provisions of the NCHA in detail.

*Chapter 1 Subject Matter and Principles**Art. 1*

<sup>1</sup> This Ordinance regulates the procedure and the requirements for promoting the establishment, operation and quality assurance of parks of national importance.

<sup>2</sup> Such promotion shall take equitable account of the biogeographical regions.

*Chapter 2 Global Financial Aid, Park Label and Product Label**Section 1 Global Financial Aid**Art. 2 Requirements*

<sup>1</sup> Global financial aid shall be granted:

<sup>a</sup> for the establishment of a park of national importance, provided a park authority (Art. 25) is designated and the feasibility of establishing, operating and ensuring the quality of the park in accordance with the requirements for the park are demonstrated;

<sup>b</sup> for managing and ensuring the quality of a park of national importance provided the requirements for the park are fulfilled.

<sup>2</sup> Financial aid shall be granted only if the canton and the communes whose territory is included in the park, as well as any third parties, participate in an equitable manner in financing the establishment, operation and quality assurance of the park.

*Art. 3 Application*

<sup>1</sup> The application by the canton for global financial aid must in particular contain:

<sup>a</sup> a summary of all efforts made on the territory of the canton to establish and operate parks of national importance;

<sup>b</sup> for the establishment of a park, a management plan and the constitution of the park authority;

<sup>c</sup> for the operation of a park, the charter on park management and quality assurance (Art. 26), the constitution of the park authority and proof of the spatial planning safeguards for the park

(Art. 27).

<sup>2</sup> In the case of supra-cantonal park projects, the cantons concerned shall coordinate their applications.

#### *Art. 4 Assessment*

<sup>1</sup> The amount of global financial aid is determined by:

<sup>a</sup> the extent and the quality of the services that will be provided in order to fulfil the requirements for the park;

<sup>b</sup> the quality of the provision of those services.

<sup>2</sup> The amount of global financial aid shall be negotiated between the Federal Office for the Environment (FOEN) and the canton.

#### *Art. 5 Programme agreement*

<sup>1</sup> The FOEN shall enter into a programme agreement with the cantonal authority concerned.

<sup>2</sup> The programme agreement shall have a maximum term of four years (the programme term).

<sup>3</sup> Financial aid for the establishment of a park shall be granted in the case of national parks for a maximum of two programme terms and in the case of regional natural parks and nature discovery parks for one programme term.

[...]

Section 3 of the Parks Ordinance states the specific requirements for Regional Nature Parks as follows:

#### *Section 3 Regional Nature Parks*

##### *Art. 19 Area*

<sup>1</sup> The area of a regional natural park shall amount to at least 100 km<sup>2</sup>.

<sup>2</sup> It shall include the entire territory of the communes concerned. Derogation from this principle is permitted if:

<sup>a</sup> a large area that is delimited naturally is being incorporated into the area of a regional nature park;

<sup>b</sup> the rural part of an extended agglomeration commune with urban residential character contributes to rounding off the area of a regional nature park.

*Art. 20 Preservation and enhancement of nature and landscape*

In a regional natural park, in order to preserve and enhance the quality of nature and the landscape:

<sup>a</sup> the diversity of the indigenous animal and plant species, the types of habitat as well as the landscapes and sites of local character must be preserved and as far as possible enhanced;

<sup>b</sup> the habitats of indigenous animal and plant species that are worthy of protection must be enhanced and linked;

<sup>c</sup> in the case of new buildings, installations and uses, the character of the landscapes and sites of local character must be preserved and enhanced;

<sup>d</sup> existing impairments to the landscapes and sites of local character by buildings, installations or uses must be minimised or eliminated when the opportunity arises.

*Art. 21 Encouraging sustainable business activities*

In regional nature parks, in order to encourage sustainable business activities, the following shall be required in particular:

<sup>a</sup> the use of local natural resources in an environmentally sound manner;

<sup>b</sup> the strengthening of regional production and of the marketing of products produced in the park;

<sup>c</sup> the encouraging of services directed towards near-natural tourism and environmental education;

<sup>d</sup> support for the use of environmentally sound technologies.

**Nature Park Feasibility**

*Protection Area > 100 km<sup>2</sup>:*

The Nature Park Alpstein would amount to 28'800ha (= 288km<sup>2</sup>) and include the communes Schwende-Rüte (AI, 9'833ha), Gonten (AI, 2'473ha), Hundwil (AR, 2'408ha), Urnäsch (AR, 4'816ha), and Nesslau (SG, 9'270ha).



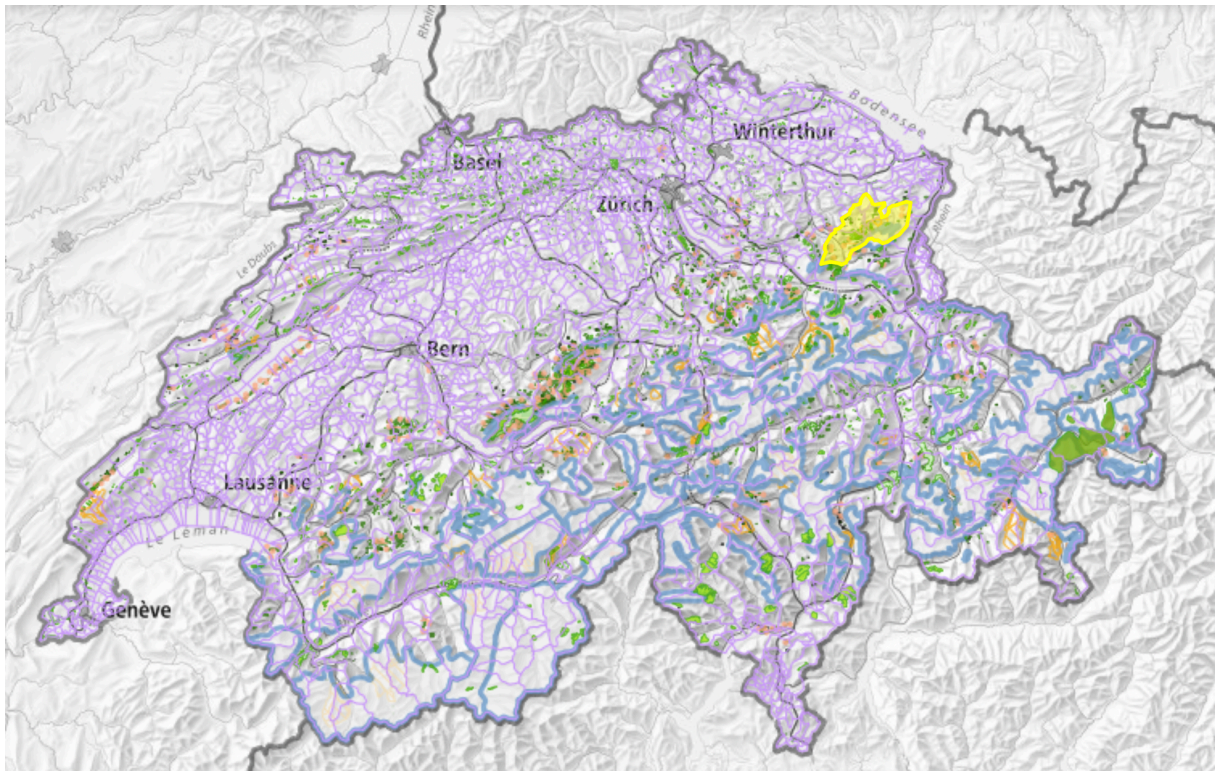


Figure 13: Zone Plan Nature Park Alpstein, macro perspective

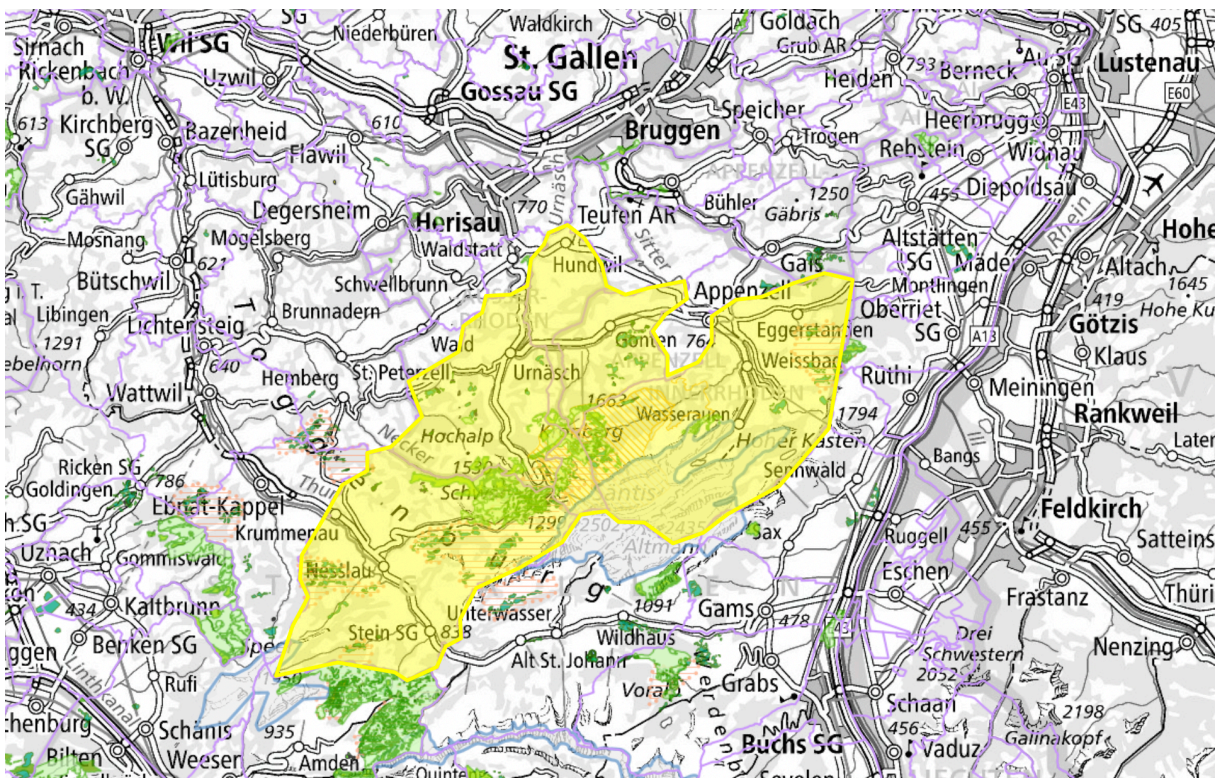


Figure 14: Zone Plan Nature Park Alpstein, micro perspective



*High cultural, natural, and landscape values:*

As indicated on the Geo Map below, the intended nature park zone includes environmentally valuable forest reserves (green), mire landscapes (horizontal stripes), hunting ban areas (angled stripes), and ibex colonies (blue).

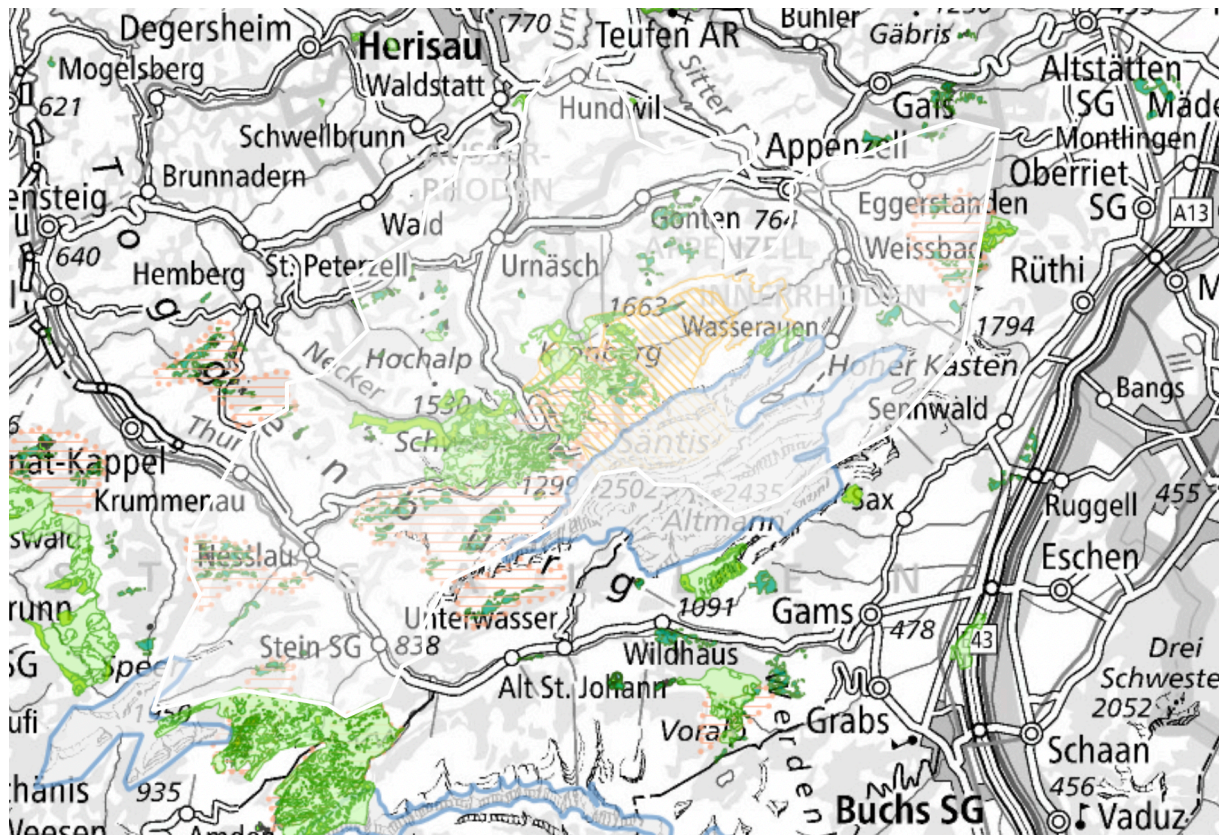


Figure 15: *Biodiversity & Landscape Value, Alpstein Region*