

## **Diving beneath Swedish Protected Waters**

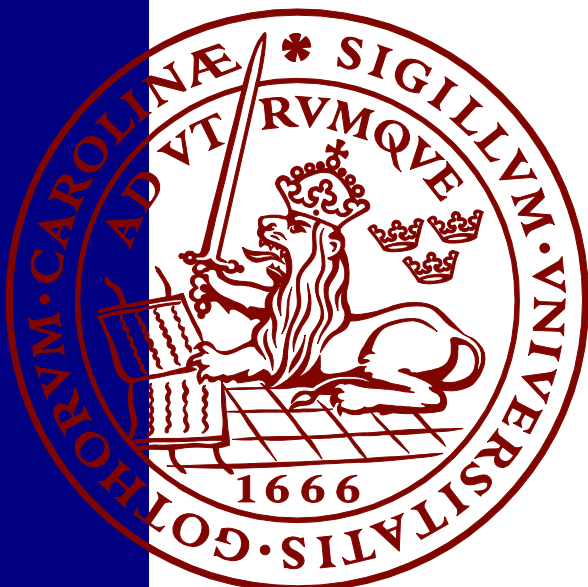
Understanding governance and management of the HELCOM  
Marine Protected Areas (HELCOM MPAs) in Skåne, Sweden

*María Andrea Cervantes Becerra*

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(30hp/credits)



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Supervisor: Elina Andersson, LUCSUS, Lund University

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## **Abstract**

Marine protection has gained global attention following international and national goals for coverage percentages of Marine Protected Areas (MPAs) with effective management. In the Baltic Sea, a network of HELCOM MPAs has been established to contribute to international goals through regional collaboration. As part of the Baltic Sea Area, Sweden has also set targets for marine protection. Unfortunately, the environmental status of marine environments is considered unsatisfactory and the governance and management have not fulfilled the needs for a sustainable use of the marine resources. On top of this, increasing international pressure from targets, also increases the demands and challenges for a resilient governance and an effective management in MPAs.

This thesis brings understanding of the governance and management of four HELCOM MPAs in Skåne as a questioning point for the achievement of international and national goals for marine protection in Sweden. Using literature review, semi-structured interviews, and document analysis, an interdisciplinary research approach is applied through the Marine Protected Area Governance framework under the concepts of Social-Ecological Resilience in the HELCOM MPAs in Skåne as complex Social-Ecological Systems. The framework is employed for the recognition of the governance and management structure and characterization, as well as the incentives applied as conservation strategies, and the arisen gaps and challenges. Finally, interconnectedness of core incentives through a Systems Thinking approach is developed in a Causal Loop Diagram. The results indicate that the HELCOM MPAs in Skåne have been implemented and managed through a decentralization process with a certain control from the state. A diverse set of incentives has been applied under the 5 categories of the framework. However, state funding, collaborative platforms, awareness, and uncertainty are some of the incentives that present gaps and challenges with a need for their interconnectedness for improvement and the achievement of positive social-ecological outcomes through a resilient governance and an effective management.

The study of social and ecological spheres of MPAs is essential for questioning the implementation of current and future goals for marine conservation, where focusing on coverage percentages can mislead the intention of their implementation and generate further negative social and environmental impacts in the long-term. Indeed, diving under protected waters for the understanding of governance and management, as well as the diversity and interconnectedness of incentives within MPAs, such as the HELCOM MPAs in Skåne, is essential for a social-ecological resilience in the protected environments and the overall health of the oceans.

**Key words:** Baltic Sea, Marine Protected Area Governance, Social-Ecological Systems, Systems Thinking, marine protection, conservation goals.

**Word count (thesis):** 12,000 words.

## Resumen

La protección de ecosistemas marinos ha ganado atención global siguiendo los objetivos nacionales e internacionales de porcentajes de cobertura de Áreas Marinas Protegidas (AMPs) con una gestión eficaz. En el Mar Báltico, se ha establecido una red de AMP HELCOM para la contribución hacia objetivos internacionales a través de una colaboración regional. Como parte del del mar Báltico, Suecia también ha establecido objetivos para la protección marina. Desafortunadamente, el estado ambiental de los ecosistemas marinos no se considera satisfactorio y la gobernanza y la gestión no han satisfecho las necesidades de un uso sostenible de los recursos marinos. Además, la creciente presión internacional de los objetivos, también aumenta las demandas y desafíos para una gobernanza resiliente y una gestión eficaz en las AMP.

Esta tesis contribuye a la comprensión de la gobernanza y la gestión de las cuatro AMP de HELCOM en Scania, como un punto de cuestionamiento para el logro de los objetivos nacionales e internacionales actuales para la protección de ecosistemas marinos en Suecia. Mediante la revisión de literatura, entrevistas semiestructuradas y análisis de documentos, un enfoque de investigación interdisciplinario es aplicado a través del marco de Gobernanza de Áreas Marinas Protegidas bajo los conceptos de resiliencia social-ecológica en las AMPs HELCOM en Scania como sistemas sociales-ecológicos complejos. El marco se ha empleado para el reconocimiento de la estructura y caracterización de gobernanza y manejo, así como los incentivos aplicados como estrategias de conservación, y las brechas y desafíos surgidos. Finalmente, la interconexión de los incentivos centrales a través de un enfoque de pensamiento sistémico se ha desarrollado a través de un diagrama de ciclos causales. Los resultados indican que las AMP HELCOM en Scania se han implementado y gestionado a través de un proceso de descentralización con cierto control por parte del estado. Se ha aplicado un conjunto diverso de incentivos en las 5 categorías del marco. Sin embargo, el financiamiento estatal, las plataformas colaborativas, la conciencia e incertidumbre, como algunos de los incentivos que presentan brechas y desafíos, se han identificado con la necesidad de reconocer su interconexión para mejorar y lograr resultados sociales-ecológicos positivos a través de una gobernanza resiliente y una gestión eficaz.

El estudio de los ámbitos tanto sociales como ecológicos de las AMP, es fundamental para cuestionar la implementación de las metas actuales y futuras de conservación marina, donde el enfoque en porcentajes de cobertura corre el riesgo de desviar la intención de su implementación y generar mayores impactos negativos en las sociedades y ambientes a largo plazo. En efecto, adentrarse en aguas protegidas para comprender la gobernanza y la gestión, así como la diversidad e interconexión de incentivos en las AMP, como las AMP HELCOM en Scania, es esencial para una resiliencia social-ecológica en los ecosistemas protegidos y para la salud general de los océanos.

**Palabras clave:** Mar Báltico, Gobernanza de Áreas Marinas Protegidas, Sistemas Sociales-Ecológicos, pensamiento sistémico, protección marina, metas de conservación.

**Conteo de palabras (tesis):** 12,000 palabras.

*To my father*

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Skålderviken, Sweden. Author's image.



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## List of Abbreviations

BSAP	Baltic Sea Action Plan
CAB Skåne	County Administrative Board of Skåne
CBD	Convention of Biological Diversity
CHG	Co-evolutionary Hierarchical Governance
CLD	Causal Loop Diagram
EU	European Union
EUSBSR	European Union Strategy for the Baltic Sea Region
FNF	Falsterbo’s Nature Conservation Association
GES	Good Environmental Status
HELCOM	Helsinki Commission
I-	Semi-structured interview
ME	Ministry of the Environment
MPA	Marine Protected Area
MPAG	Marine Protected Area Governance
MSFD	Marine Strategy Framework Directive

NGO	Non-governmental organization
RQ	Research Question
SAC	Special Area of Conservation (Habitats Directive - Natura 2000 network)
SCI	Site of Community Importance (Habitats Directive - Natura 2000 network)
SDG	Sustainable Development Goal
SEC	Swedish Environmental Code
SEPA	Swedish Environmental Protection Agency
SER	Social-Ecological Resilience
SES	Social-Ecological System
SFPO Skåne	Swedish Fishermen's Producer Organization in Skåne
SPA	Special Protection Area (Birds Directive - Natura 2000 network)
SwAM	Swedish Agency for Marine and Water Management
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea

# 1 Introduction

## 1.1 International marine protection

Internationally, the protection of defined marine geographical spaces has been introduced with the aim of accomplishing “*long-term conservation of nature with associated ecosystem services and cultural values*” (Dudley & Stolton, 2008, p.125). To achieve this, regulation and management over the use of the resources have been implemented to reduce anthropogenic threats and impacts, giving the opportunity to ecosystems to recover and sustain natural wildlife processes in the long term (Laffoley, et al., 2019). Following these actions, the development of more resilient marine environments for current and future hazards is enabled, strengthening valuable diversity and ecosystem services for our survival and social and economic development (SEPA, 2009).

In the last decades, marine protection has increasingly gained global attention, following international goals and agreements, such as the Aichi Biodiversity Target 11 and the Sustainable Development Goal (SDG) 14 (Segment 14.5). Currently, the Aichi Biodiversity Target 11 sets a 10% of “*effectively and equitably managed, ecologically representative and well-connected systems*” of marine and coastal protected areas by 2020 (CBD, 2010, p.9). Likewise, the SDG 14 sets at least 10% of “*coastal and marine areas, consistent with national and international laws and based on the best available scientific information*” by 2020, with effective management and regulations implemented for the avoidance of hazards and increment of ecological resilience of the oceans (UN, 2015, p.28) Although the global marine protection coverage is currently around 7.5% of marine areas (Protected Planet, 2020a), which means that the target is only around 2.5% far from being achieved, the management and monitoring assessments of Marine Protected Areas (MPAs) have generally represented a challenge due to a lack of iterative assessment, reporting, and collection of reliable data (UNEP-WCMC, IUCN & NGS 2018; Coad, et al., 2015). On top of this, global collaboration and coordination are still claimed by Grip (2018) to need improvement regarding marine governance.

## 1.2 The Baltic Sea and the Swedish ambition for marine protection

When it comes to the Baltic Sea, a network of MPAs (HELCOM MPAS) has been established to protect “*valuable marine and coastal habitats*” (HELCOM, 2013) through regional collaboration in the area, which has been considered to contribute to international marine conservation goals. In fact, the Baltic Sea is considered the first regional sea that has achieved the Aichi Biodiversity Target 11 in terms of spatial coverage (HELCOM, 2014). Unfortunately, according to the World Wildlife Fund (2016), the designation and management of the HELCOM MPAs of the countries surrounding the Baltic Sea, have indicated that more effort is required from each country since several MPAs are not considered ecologically coherent (interacting and supporting the environment and its processes). Furthermore, they do not meet the protection objectives in terms of management effectiveness and biodiversity, due to a lack of long-term management strategies.

In Sweden, the Milestone Target on the Protection of Land Areas, Freshwater Areas and Marine Areas, also sets a 10% of MPAs in Sweden by 2020 (Swedish Government, 2013), being in line with the mentioned international targets for marine protection. At present, the coverage percentage of MPAs in Sweden, has certainly accomplished and exceeded the national and international targets, with a 15.38% of protected marine territory (Protected Planet, 2020b). Still, the Swedish marine environmental status is considered as unsatisfactory (SwAM, 2018), and as mentioned by Grip (2018), the governance and management strategies in Sweden for the protection and conservation of the marine environment, have neither fulfilled the needs for a sustainable use of the marine resources through an integrated governance approach and an inter-sectoral management. Moreover, only few studies have been carried regarding the challenges related to the implementation, and management of these areas (Hovik, Sandström & Zachrisson, 2010).

It is clear that increasing international pressure for MPAs’ coverage to fulfill existing and future targets, consequently increases the demands and challenges for a resilient governance and effective management that can lead to positive social-ecological outcomes. For this reason, the implementation and interconnectedness of incentives that allow users and institutions to strengthen their linkages through communication, knowledge, and cooperation, is not only vital for achieving national and international marine conservation goals, but also for accomplishing a social and ecological resilience in the marine environments designated for protection.



### 1.3 Aim, objectives, and research questions

The aim of this thesis is to expand understanding and awareness of the importance of incorporating and analyzing the interaction between ecological, social, economic, and political aspects for the application of sustainable conservation strategies for marine protection in the long term. Moreover, to increase knowledge of how the understanding and the application of diverse interconnected incentives, can lead to a more resilient governance and an effective management that go beyond the achievement of conservation goals in terms of coverage protection percentages. In this sense, I use the regional case of the HELCOM MPAs in Skåne as a questioning point for the accomplishment of present international and national goals for marine protection, with the current governance and management applied to these areas in Sweden.

The objectives are to identify the structure and provide characterization of the governance and management that are currently performed in the HELCOM MPAs of Skåne, according to the MPAG Framework proposed by Jones (2014). Moreover, to investigate which common incentives have been implemented for the conservation of these areas, addressing objectives, threats, and impacts. By accomplishing this, I seek to identify shared social, economic, and political gaps and challenges that have been present throughout the process, as well as to analyse the interconnectedness of core incentives in these areas, for the improvement and achievement of a resilient governance network among institutions and actors, and an effective management for positive environmental and social outcomes.

For the accomplishment of these objectives, the following research questions are formulated:

Research Questions (RQ):

- **RQ1:** *How is the current governance and management structure in the HELCOM MPAs in Skåne, and how can the governance arrangements be characterized according to the Marine Protected Areas Governance framework?*
- **RQ2:** *Which common incentives have been applied as conservation strategies for addressing objectives, threats, and impacts through the governance and management of the HELCOM MPAs in Skåne?*
- **RQ3:** *What are the current shared social, economic, and political gaps and challenges across the cases throughout the application of incentives in the HELCOM MPAs of Skåne, and how could the incentives' interconnectedness, through a Systems Thinking approach, be improved?*

## **1.4 Contribution to Sustainability Science**

The ocean has been a vital ecosystem before and during the development of human civilizations (Jouffray, 2019). Unfortunately, it has been globally affected by unsustainable practices and exploitation of resources. The Baltic Sea is one of the most alarming examples of negative anthropogenic impacts, affecting not only marine ecosystems, but also social and economic aspects of the human population surrounding it. For this reason, the study of social and ecological dynamics in the marine ecosystems, and the interaction between them, currently represents a global concern, and is key for the study of sustainability science. Moreover, bringing understanding of how social processes and decisions intervene in ecological, economic, and political aspects of marine conservation, is vital, and not only complementary, in the implementation, governance, and management of MPAs; contributing with this, to foster social change and the overall knowledge of this region.

This thesis points at the importance of the role that a resilient governance and an effective management play for the achievement of sustainable conservation strategies and positive social-ecological outcomes for MPAs in the long term. The theory and methodology employed, using a practical regional example in Skåne County, not only contribute to the study of “non-observable aspects” such as institutional processes and structures specifically for HELCOM MPAs, but also dive into the study and the understanding of the types of incentives that are being applied through the governance and management in this region for addressing objectives and present and potential impacts. Besides this, it presents the gaps and challenges that have come during the process, showing the interconnection of core incentives applied and the areas of opportunity for the implementation of sustainable conservation strategies that could improve the social-ecological resilience of the areas, while successfully achieving national and international conservation targets.

Finally, raising awareness about the importance of thinking beyond coverage protection, stretches the gap between marine management and conservation goals such as the Aichi Biodiversity Target 11 and the SDG 14, among others. This represents an important factor to consider in existing and future areas, since a non-resilient governance, and unsustainable, unmanaged, and unmonitored practices and regions in the sea, can lead to a collapse of the marine ecosystems, even the protected ones.

## **2 Background**

### **2.1 The status of the Baltic Sea**

The Baltic Sea is one of the largest semi-enclosed areas of brackish water with a surface of 415,000 km<sup>2</sup>, being characterized for a very low water exchange (HELCOM, 2018). Although it is globally considered as a small ocean with low biodiversity, the Baltic Sea presents high variability of physicochemical properties, offering numerous habitats for marine and freshwater species (Snoeijs-Leijonmalm & Andrén, 2017).

The Baltic Sea is surrounded by 8 countries within the European Union (EU) (Poland, Lithuania, Sweden, Finland, Germany, Denmark, Latvia, and Estonia), and the Russian Federation; and it is inhabited by more than 85 million people, providing food and transportation (Snoeijs-Leijonmalm & Andrén, 2017), as some of the most important resources. Unfortunately, its oceanography and geography highly influence the susceptibility of the ecosystems to negative environmental impacts caused by anthropogenic activities (HELCOM, 2010).

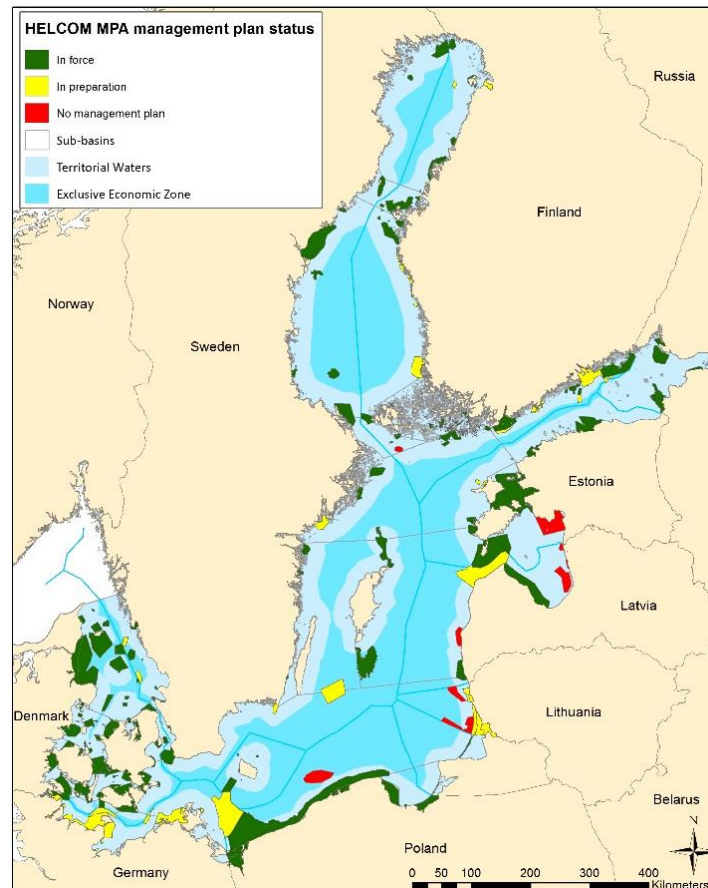
Historically, commodification of resources and industrialization towards modernization and economic development, have resulted in overexploitation of resources and coastal areas (Peet, Robbins & Watts, 2011). As a result, eutrophication, disruption of trophic cascades (Jones, Qiu, & De Santo, 2013; Casini et al., 2008), habitat and biodiversity loss, and presence of non-indigenous species (HELCOM, 2018), currently threaten the ecological dynamics and human activities that depend on this region. On top of this, current pressures, such as ocean warming, acidification, and deoxygenation (Reusch, et al., 2018), jeopardize the future of a healthy ecosystem in the Baltic Sea.

### **2.2 The Helsinki Commission**

The Baltic Sea is currently under protection through the “Convention on the Protection of the Marine Environment in the Baltic Sea Area”, known as the Helsinki Commission (HELCOM) (Valman, 2014). HELCOM was revised and signed in 1992 by 10 contracting parties: the European Community, the eight EU countries bordering the Baltic Sea, and the Russian Federation (European Commission, 2019a). These parties are involved in the Baltic Sea Action Plan (BSAP) of HELCOM, for the reduction of environmental deterioration and a “Good Environmental Status” (GES) in the Baltic Sea by 2021 (HELCOM, 2007). For the achievement of this, the designation the HELCOM MPAs as a network of well-managed and ecologically coherent MPAs, has been adopted as the only designation for the protection of habitats and species specific to this region (WWF, 2016).

Currently, there are 176 HELCOM MPAs covering approximately 12% of the Baltic Sea (Figure 1) (HELCOM, 2020c). As mentioned by HELCOM (2014), this contributes to several Aichi Biodiversity Targets, specifically stressing the Aichi Target 11. Nevertheless, the actions committed for the BSAP, have shown overall negative scores for eutrophication, hazardous substances, maritime activity, and biodiversity (WWF, 2018), with around 30% of the management plans, still awaiting implementation (HELCOM, 2018).

As mentioned by Gilek, Karlsson, Linke and Smolarz (2016), the marine governance and its regionalization in the Baltic Sea, has increased the possibility to improve coordination and cooperation between international, regional, and national levels. However, transnational and cross-sectoral collaboration, along with complexity and uncertainty between science and politics, still represent big challenges to address for positive social-ecological outcomes in the Baltic Sea, hindering the achievement of international and national objectives that concern it.



**Figure 1.** Map presenting the status of the Baltic Sea Area's management plans. The HELCOM MPAs shown in dark green show a management plan in force (area designated and managed), the ones in yellow are under preparation (area designated and partly managed), and the ones in red do not have a management plan (only area designated). Source: HELCOM, 2017

## 2.3 The Swedish marine territory

Located in the Scandinavian Peninsula, Sweden has the longest shoreline in comparison to other European countries, and the largest marine territory and drainage area in the Baltic Sea Area. As a result, its marine territory possesses an important variety of habitats and species. For this reason, the actions and the conservation strategies in the country, are highly influential for the Baltic Sea Area. This, since they directly impact several sub-basins of the Baltic Sea, their drainage areas, and the human population depending on them, where HELCOM nearly completely covers the Swedish coastline, excluding the Skagerrak basin (Figure 2) (Swedish Government, 2010).



**Figure 2.** The Baltic Sea basin and its sub-basins. The red line shows the drainage area of the Baltic Sea under the protection of HELCOM. With exception of the Skagerrak basin, the Swedish shoreline is completely covered by the HELCOM Baltic Sea Area. Modified from source: HELCOM, 2018.

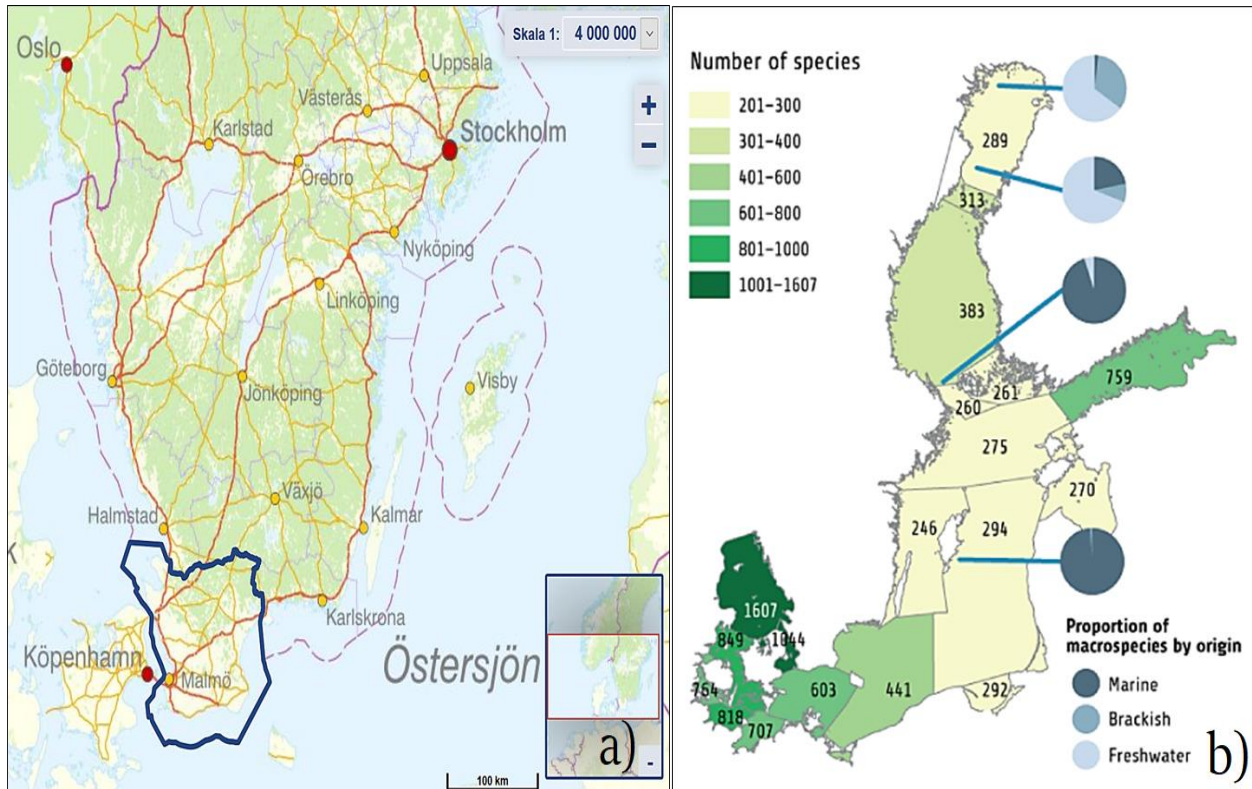
In Sweden, MPAs have been employed as a conservation tool since 1980, historically being highly influenced by decisions at the Baltic Sea and EU level (Grip, 2018). The most common designations for protection are: Nature Reserves, Natura 2000 (EU designation) and National Parks (Oscarsson, 2016). At present, there are more than 90 Swedish MPAs under multiple protection designations (SCB, 2019), from which 28 are established as HELCOM MPAs (HELCOM, 2020d) (Figure 3).



**Figure 3.** Map of the 28 HELCOM MPAs in Sweden (presented in blue). Author’s image. Primary data source: SEPA, 2020. Map developed in ArcGIS Pro 2020.

### 2.3.1 Skåne County

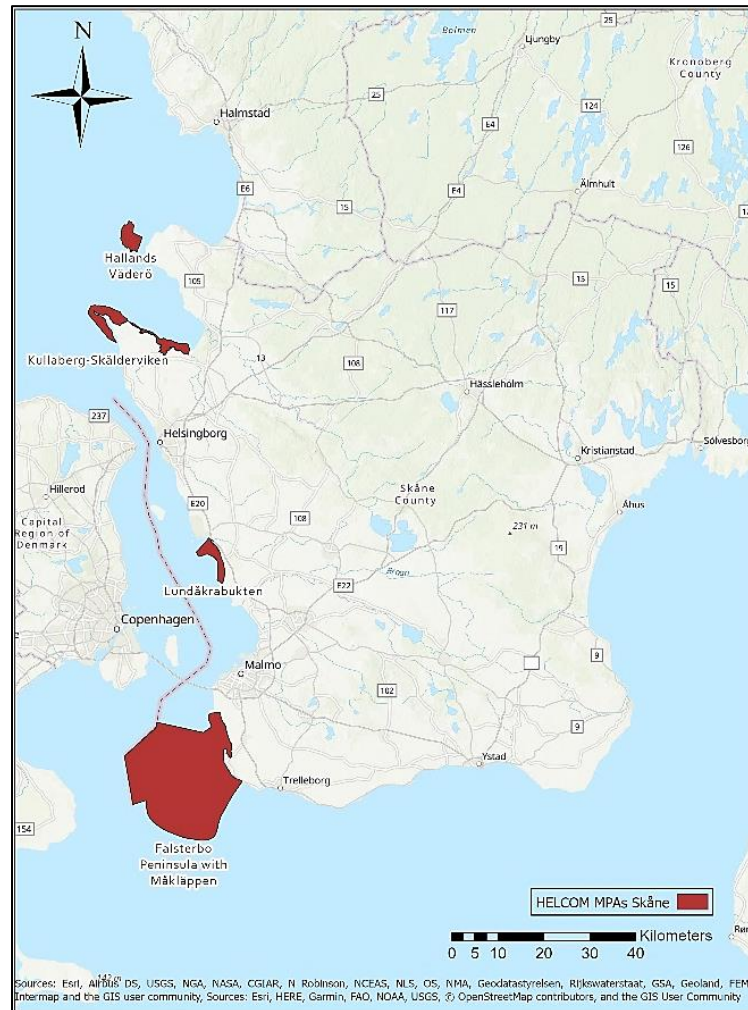
The County of Skåne (Figure 4a) is located in the southwest region of Sweden hosting around 1.3 million inhabitants (SCB, 2018). Skåne presents the largest biodiversity in Sweden (Region Skåne, 2014) and a significant number of marine species in the Baltic Sea (Figure 4b) (HELCOM, 2018), being the county with the highest percentage of MPAs in Sweden (42%) (SCB, 2019). Nevertheless, extinctions and endangered biodiversity in Skåne also exceed in numbers in comparison with other regions in Sweden, where the sea level rise, coastal erosion, and eutrophication are important environmental issues. Moreover, tensions between the use of the land for developmental purposes and the efforts for protection and conservation, as well as cultural values, are a real concern (Region Skåne, 2014).



**Figure 4.** a) Skåne County delimited in dark blue; b) Number of species and proportion of microspecies by origin in each sub-basin of the Baltic Sea, where the ones surrounding the County of Skåne, are some of the sub-basins with higher biodiversity in the Baltic Sea. Sources: SEPA, 2020 and HELCOM, 2018.

At present, there are 12 MPAs in Skåne under different EU and national designations, from which four geographical areas are also protected under the HELCOM designation (Figure 5) (HELCOM 2020d):

- *Hallands Väderö*
- *Kullaberg-Skälderviken*
- *Lundåkrabukten*
- *Falsterbo Peninsula with Måkläppen*



**Figure 5.** Map of the four HELCOM MPAs in Skåne presented in red. Skåne County delimited in dark blue. Author’s image. Primary data source: SEPA, 2020. Map developed in ArcGIS Pro 2020.

### ***Hallands Väderö***

Hallands Väderö is located in the Kattegat sub-basin of the Baltic Sea. The MPA is around 3 km of length, and it is comprised of a main island and small islands, being mostly characterized by a bedrock coast (Figure 6), followed by beech forests, open dry grasslands and few beaches (CAB Skåne, 2018d). Hallands Väderö presents high marine biodiversity, including rare and threatened species (CAB Skåne, 2018b), and it is considered a culturally and historically valuable area for being part of the Danish Kingdom during the Viking Age, and owned by the Swedish Torekov’s Church since the 13<sup>th</sup> Century (CAB Skåne, 1998); characteristics that attract many tourists per year.





**Figure 6.** Northern part of Hallands Väderö. Rocky formations. Author's image.

### ***Kullaberg-Skälderviken***

Kullaberg-Skälderviken, is an area of about 45 km<sup>2</sup> located where the Kattegat and The Sound sub-basins meet. As the name implies, it is comprised of 2 areas: Kullaberg and Skälderviken. Kullaberg is formed by bedrock cliffs and forests (Figure 7), hosting around 70% of the vegetation species in Sweden, and a high diversity of terrestrial and marine species. The area also has a rich cultural value as the western part was owned by the Danish Kingdom in the Medieval Period. At present, Kullaberg is one of the most important tourist destinations in Skåne with more than 6,000 visitors per year (CAB Skåne, 2019).



**Figure 7.** Kullaberg area's bedrock coast. Source: Visit Skåne, (n.d.).

Skälderviken, is an important area for connectivity between protected areas which possess large shallow marine areas and one of the largest marine wetland areas in Sweden, making it a vital area for breeding, resting, and living habitats for seabirds and other marine biodiversity. Moreover, estuaries (mixed sweet and salty areas) can be found as important feeding habitats for birds. The entire region offers several attractions for tourism and outdoor activities such as sand beaches (Figure 8), hiking trails, and sport fishing (CAB Skåne, 2018c).



**Figure 8.** Sand beach in Skälderviken area. Author’s image.

### ***Lundåkrabukten***

Lundåkrabukten (or Lundåkra bay) is located in The Sound sub-basin of the Baltic Sea. The bay is around 17 km of length and it is mainly composed by large shallow areas (Figure 9) (Ottoosson & Vendt, 2013), being an important region for bird and fish life throughout the year, and other species such as porpoises and invertebrates. Lundåkrabukten is also of cultural importance due to the presence of ancient monuments, and an attraction for commercial fishing and outdoor activities such as swimming, bird hunting, and kite surfing (CAB Skåne, 2017d).



**Figure 9.** Lundåkrabukten area. Author's image.

### ***Falsterbo Peninsula with Måkläppen***

Falsterbo Peninsula is located in the Arkona sub-basin of the Baltic Sea, and it is internationally recognized for offering different valuable habitats for wild migratory birds. The coastal waters are shallow with highly productive areas for flora and fauna, also offering attractive sand beaches for tourism (Figure 10) (CAB Skåne, 2018a). In the southern part of Falsterbo Peninsula, there is the Måkläppen Island, a sanctuary for birds and seals, being under protection since 1902, and currently significantly restricted to human presence to only 3 months per year (CAB Skåne, 2020b).



**Figure 10.** Falsterbo's sandy beach. Author's image.

### **3 Methods**

This thesis dives into the understanding of governance and management of the four HELCOM MPAs in Skåne, under an interdisciplinary approach through the application of the analytical Marine Protected Area Governance (MPAG) framework, which incorporates the concepts of Social-Ecological Resilience (SER) in MPAs as complex Social-Ecological Systems (SESs) (further explained in section 4). In this thesis, I employ the MPAG framework for the identification of the governance and management structure and characterization, as well as the incentives applied as conservation strategies for addressing objectives, threats, and impacts. Moreover, to identify the gaps (in terms of insufficiency of strategies for enforcement) and challenges that have arisen throughout the process. Finally, I apply a Systems Thinking approach through the Causal Loop Diagram (CLD) tool, using deductive reasoning to identify and visualize interconnectedness of the core incentives (the main elements of the system) present in the HELCOM MPAs in Skåne as complex SESs (the system boundary), and ultimately, for the identification of further strategies for improvement of governance and management in these areas.

In order to answer the RQs with the methodology mentioned above, qualitative methods were applied, using a combination of different types of data, such as literature review, semi-structured online interviews, and document analysis. It is relevant to mention that for the development of the thesis, I sit on the critical realism approach, seeking an intermediate point between positivism and constructivism, avoiding “scientism” and “rejections of science” (Sayer, 2000). Since critical realism recognizes social perceptions of the intransitive real objects (Bhaskar, 2008), the present methodology applied, is coherent with the data collection and the report of quotations from interviews as insights of the governance and management processes.

#### **3.1 Literature review**

The theoretical section was developed through a literature review in order to understand the theoretical foundations of the MPAG framework and its contributions to the SER and SESs approaches. Moreover, to contextualize the contribution of the implementation of the CLDs tool within the Systems Thinking approach, to the MPAG framework.

For the results and analysis section, information about key actors and official documents was collected through a snowball method from research literature and official websites. This was done to understand the governance and management structure and the institutions involved in the four HELCOM MPAs in Skåne, through laws, codes, and political decisions (such as goals and agreements), that shape the

implementation and management of the HELCOM MPAs in Skåne for the protection and conservation of their ecosystems; which will contribute to the RQ1 (Figure 11).

### 3.2 Semi-structured interviews

Semi-structured interviews (I-) were used to represent subjective perceptions and experiences of the actors involved in the governance and management of the HELCOM MPAs in Skåne, from their own jurisdictional level (interview's layout available in Appendix A). This was done to identify responsibilities and linkages between authorities (RQ1), as well as insights on demands, impacts, and challenges that are reflected in the governance and management of these areas (RQ2 and RQ3) (Figure 11).

The interviews were arranged by identifying the key actors from the literature review, document analysis, and through snowball sampling (where the actors were mentioned along the interviews, in research articles, official documents and reports, or on official websites). The interviews were done via online due to the Covid-19 outbreak (with exception of the I-10, which was done in person as the interviewee mentioned to not feel experienced enough to use online platforms for communication), following the ethical standards for a social science research (De Guchteneire, 2014). A total of eleven interviews were performed (I-1 and I-2; & I-4 and I-5, were developed at the same time):

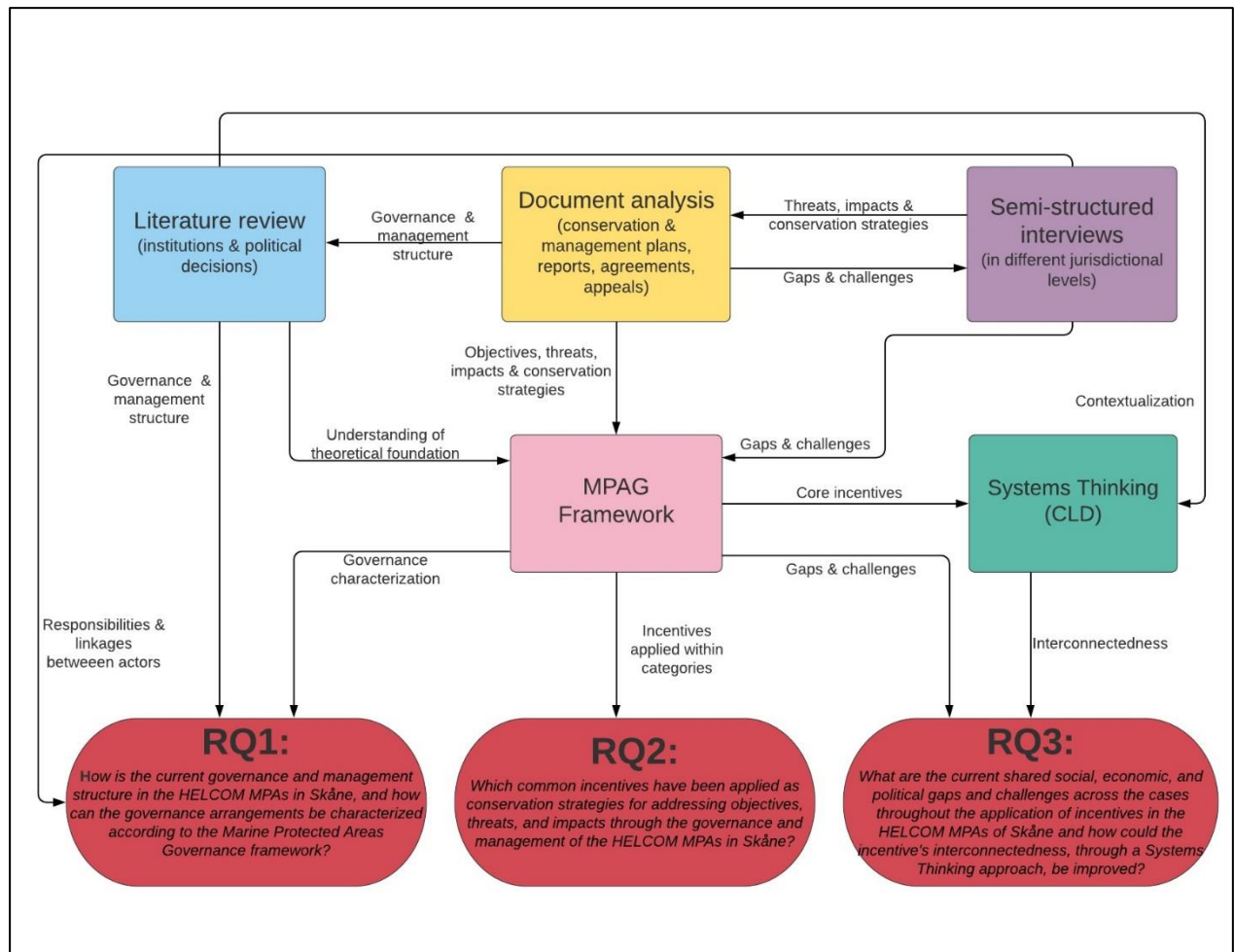
1. The Swedish Agency for Marine and Water Management (SwAM) 7<sup>th</sup> April 2020
2. SwAM 7<sup>th</sup> April 2020
3. Höganäs Municipality 16<sup>th</sup> April 2020
4. The County Administrative Board of Skåne (CAB Skåne) 17<sup>th</sup> April 2020
5. CAB Skåne 17<sup>th</sup> April 2020
6. CAB Skåne 22<sup>nd</sup> April 2020
7. Båstad Municipality 24<sup>th</sup> April 2020
8. Swedish Environmental Protection Agency (SEPA) 7<sup>th</sup> May 2020
9. Ministry of the Environment (ME) 12<sup>th</sup> May 2020
10. Falsterbo's Nature Conservation Association (FNF) 30<sup>th</sup> July 2020
11. Swedish Fishermen's Producer Organization in Skåne (SFPO Skåne) 26<sup>th</sup> Aug 2020

The questions included in the interviews were deductively adjusted to the MPAG framework and to the level of governance of each interviewee, since the responsibilities and decision power at each institutional level is different for the governance and management of the HELCOM MPAs in Skåne. The duration of the interviews lasted from 40 to 60 min with exception of the I-8 (20 minutes) and the I-10 (90 minutes). Each of the interviews were recorded and transcribed. After this, the transcribed material was thematically coded into the categories and incentives that the MPAG framework provides, using a deductive method for analysing the application of the theory to the case (Hyde, 2000). The codification of the material was used to identify the incentives applied within the 5 categories of the MPAG framework for addressing the RQ2, and the further identification of gaps and challenges. Finally, it was used for the analysis of the core incentives' interconnectedness through the complementary Systems Thinking approach, using a CLD as a visualization tool, for addressing the RQ3 (Figure 11).

### **3.3 Document analysis**

Apart from the interviews, a document analysis was thematically performed through the collection of official documents, such as management plans, reports, decisions, and appeals from the institutions' official websites. This was done with the purpose of obtaining official information about the jurisdictional levels and the official documents employed for the governance and management of the areas (contributing to RQ1) (Figure 11). Moreover, to acquire information about the context, objectives, threats, and impacts in the areas, the incentives applied following the MPAG framework, and the present gaps and challenges (contributing to RQ2 and RQ3) (Figure 11).

The management and conservation plans were a key information source for each of the four HELCOM MPAs in Skåne ("Skötselplaner" and "Bevarandeplaner" in Swedish) since they comprise the decisions and agreements after the appeals or comments for the management of the areas. These plans were obtained from the SEPA's website of National Protected Nature with public access. According to CAB Skåne (I-4, I-5, & I-6), since the HELCOM MPAs in Skåne do not have a specific management plan for the HELCOM designation, the Natura 2000 conservation plans are applicable for the strategies applied in the four HELCOM MPAs. However, the Natura 2000 management plans state that when a Natura 2000 area is also designated as a Nature Reserve (both further explained in section 5.1), the management plan for this designation must also be consulted (CAB Skåne, 2018b). For this reason, both Natura 2000 and the Nature Reserves management and conservation plans of the four HELCOM MPAs in Skåne, were used as the most reliable and applicable sources, apart from the interviews, for the analysis of the governance and management in these areas.



**Figure 11.** Data collection and contributions to research questions. Diagram developed in Lucidchart.

### 3.4 Case selection: HELCOM MPAs in Skåne

This research was conducted only in the HELCOM MPAs of Skåne due to their high valuable marine biodiversity, and time restraints and accessibility to the region. It is important to emphasize that there are more MPAs in Sweden under the HELCOM and other designations for protection. Hence, the results and analysis of this thesis are only applicable to the 4 areas designed as HELCOM MPAs in the county of Skåne. Thus, the results for governance and management that involves them, might differ from the structure, strategies, and decisions applied to other MPAs in Skåne and other counties of Sweden.

The motivation behind choosing HELCOM MPAs is because they are part of a network of cooperation that include relevant goals for the Baltic Sea and Sweden and are included as vital contributions to international targets for marine conservation. Moreover, the reason why I chose to work at a regional level is because the current governance approach and management strategies present in this region indicate that the power of decision and implementation is not allocated at the local level, but rather at regional, subnational and national levels (Sections 5.1 and 5.2). Nevertheless, local perspectives about the activities, values and interests of the areas are also considered to have an important influence on the impacts and challenges within the HELCOM MPAs in Skåne, as well as on the decisions taken for the application of incentives. For this reason, these perspectives are also included in the research, following the theoretical foundation of the MPAG framework.

Even when the management is performed at a regional level, it is important to mention that although the strategies applied for each of the MPAs should address specific necessities of each areas, common incentives are also applied in the four areas (e.g. provision of state funding to the regional level). In this thesis, the incentives mentioned will be shared incentives with particular examples of the areas, where the decisions are mainly taken by the regional authority, as already mentioned.

### **3.5 Research limitations**

As previously stated, I will present the common incentives, gaps, and challenges of the HELCOM MPAs in Skåne, with specific examples of the areas from local interviews or comments regarding specific areas. This might oversimplify, to some extent, the complexity of the areas concerning specific relations and conflicts, but not of the general concept of the governance and management of the MPAs as complex SESs. Moreover, as it was mentioned before, the management plans employed for the present study are the ones created in overlapping designations with the HELCOM MPAs due to lacking specific management plans for the HELCOM designation. For this reason, the information obtained from these sources is applicable to the areas, but does not completely address the HELCOM necessities for the studied MPAs. I consider this a very important limitation but also a good standing point for my study, as it helps to bring attention to the need of reinforcement for HELCOM through the development of plans that specifically address the needs and objectives of these areas, as it will be mentioned later.

Another limitation is the number of interviews performed, since other actors included could not be reached for diverse reasons (Section 5.3.3). Besides this, the document analysis presented some difficulties since most of the information in management plans and websites, was only available in



Swedish. The translation of the documents from Swedish to English was possible through an online translator, however, I acknowledge the probability of misunderstandings present throughout the research process. Another language limitation was presented during the interviews, since Swedish is the mother tongue of all the interviewees, and some of them had difficulties translating specific concepts or institutions to English. Nevertheless, the recording of the interviews facilitated the revision of concepts for further interpretation. It is also important to consider that my personal interpretation of the answers during the interviews might influence the results. However, the questions were always made referring to what the interviewee thought from their personal perspectives and experiences.

Finally, I acknowledge that HELCOM MPAs are just part of the work of SwAM, the CAB Skåne and other actors involved, since they work with other Nature Reserves and Natura 2000 in the region, including the land-based areas for the CAB Skåne (CAB Skåne, 2020a). However, although my boundaries are set only for the current designated HELCOM MPAs in Skåne, it is necessary to make emphasis on the need for more research for the rest of the MPAs in Sweden, including the HELCOM ones, to acquire broader knowledge of local, regional and national marine protection.

## **4 Theory**

As mentioned in the methodology, the analytical MPAG framework employed incorporates SER for the study of complex SESs, in this case, the HELCOM MPAs in Skåne. These concepts will help introduce the theoretical foundation and construction of the MPAG framework. Moreover, they will help give context to the analysis of the governance and management of these areas (Section 5) in terms of diversity and interconnectedness of incentives that can address challenges and reduce gaps, leading to resilient social and ecological systems.

### **4.1 Social-Ecological Systems and Social-Ecological Resilience**

SESs were adopted by Berkes and Folke (1998), for the study of social (institutions) and ecological (ecosystems) schemes as interlinked systems (Colding & Barthel, 2019). According to Berkes and Folke (1998), the understanding of the functioning of the variables within a SES cannot be developed without studying them together, since the linkage between them leads to particular outcomes which, in turn, can modify the linkages or their interactions through co-evolution or adaptations for resilience.

SER has been developed from the study of resilience for ecological systems. Introduced by Holling (1973, p.17), resilience *“determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist”*. According to Holling (1986), the interactions and interconnectedness of the variables in the systems is what creates their complexity; given that a higher diversity of interactions leads to greater complexity of a system, which consequently increases its resilience by lowering its stability.

An analogy for biodiversity in ecological systems, Jones (2014), the developer of the MPAG framework, mentions that the diversity of interactions between institutions allows the development of resilient social and governance systems. In this sense, the incorporation of SER into the study of complex SESs, has been considered to support social, ecological, and economic sustainability (Berkes, Colding & Folke, 2003). For the study of governance and management of MPAs, studying them as complex SESs is essential for the improvement of their SER through the application of a diverse and interconnected set of incentives that can lead to the achievement of environmental objectives through positive social-ecological outcomes.

## **4.2 The Marine Protected Area Governance Framework**

### ***4.2.1 Theoretical foundation***

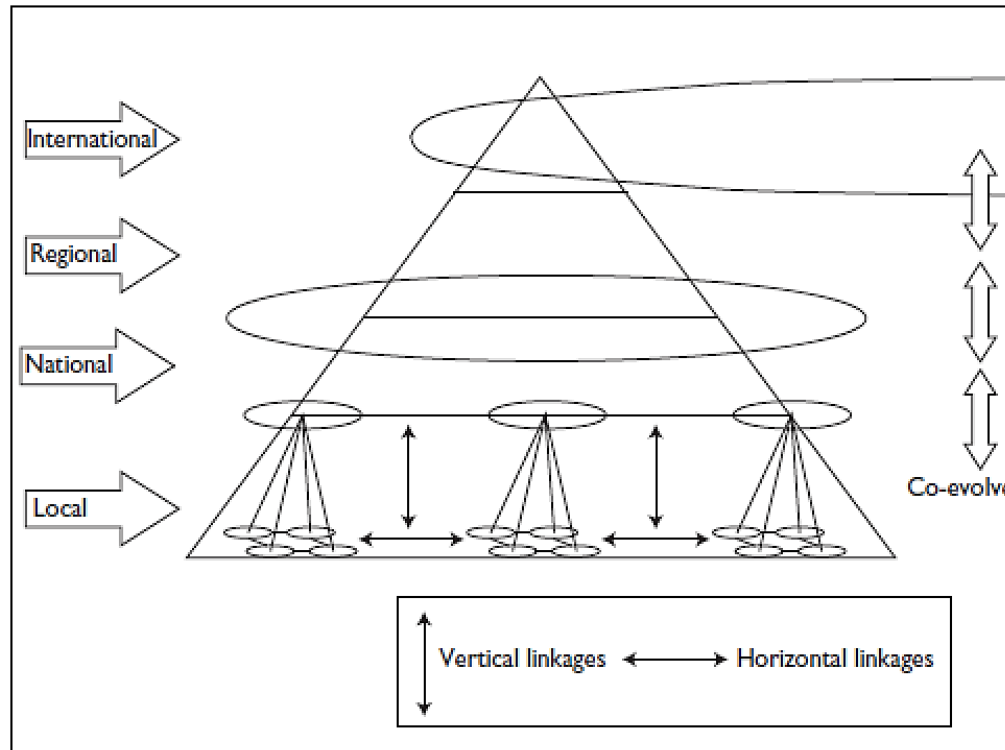
According to Jones, Qiu, and De Santo (2013), the MPAG framework provides empirical contributions to the study of the governance and management of complex SESs, specifically for MPAs. Taking governance as *“a broader set of elements that includes all the groundwork through to the negotiations and discussions that underpin management and influence human behaviour”* and management as *“a part of governance and a formal representation of official decisions that can be readily seen, such as management plans, management groups and regulations”* (UN Environment, 2019a, p.15).

The purpose of the MPAG framework is to encourage behavioural changes and help enhance decisions for marine conservation, developing a resilient governance and an effective and adaptive management (Jones, Qiu, & De Santo, 2013). This, through an analysis of the application of incentives that promote equity and help achieve national and international conservation targets, pursuing a balance between a sustainable use of the resources and the conservation of the marine ecosystems (UN Environment, 2019a).

The theoretical foundation of the framework takes an alternative governance approach with the concept of “Co-evolutionary Hierarchical Governance” (CHG), which is introduced by Jones (2014), and grounded on a set of neo-institutional theories highlighting the role of institutions in the social agency in fostering SER and sustainable SESs. Moreover, it incorporates the view of “polycentric governance” developed by Ostrom (2010) where institutions and governments with decision-making processes at multiple levels fit the management of natural resources and endorse sustainable communities (Figure 12).

As stated by Jones (2014), the CHG approach takes a standpoint where three different governance approaches can be integrated: the top-bottom approach (where the government possesses and exercises the power exclusively from the highest to lower levels in the system), the market-based approach (economy-led), and the bottom-up approach (with defined boundaries and local solutions for communities). Under this theoretical concept, the state is still considered an essential actor for the provision of the necessary tools for the accomplishment of social objectives (Jones, 2014; Bell & Hindmoor, 2009), while decentralization, where the state can deconcentrate, delegate or devolve power (see glossary for definitions) and responsibilities to lower levels, is necessary for local and even private interests, in order to achieve broader and place-specific objectives (Jones, 2014). This is consistent with Ostrom and Cox work (2010, p.451), as they point at the necessity of “*moving beyond panaceas*” without applying single solutions to complex problems, and recognize “*the need for a diversity of institutional processes that are matched to the scale and characteristics of the particular ecological and cultural systems involved*” where both “*local and more central governance structures*” need to be considered (Ostrom & Cox, 2010, p.454).

This combination of approaches facilitates the development of bidirectional vertical and horizontal linkages that allow institutions to co-evolve, affecting the development of each other (Figure 12), through a diverse set of interconnected incentives that lead to a SER with positive environmental outcomes in MPAs (UN Environment, 2019a). As mentioned by Jones, Qiu, and De Santo (2013, p.5): “*the key to resilience is diversity, both of species in ecosystems and of institutions in governance systems*”.

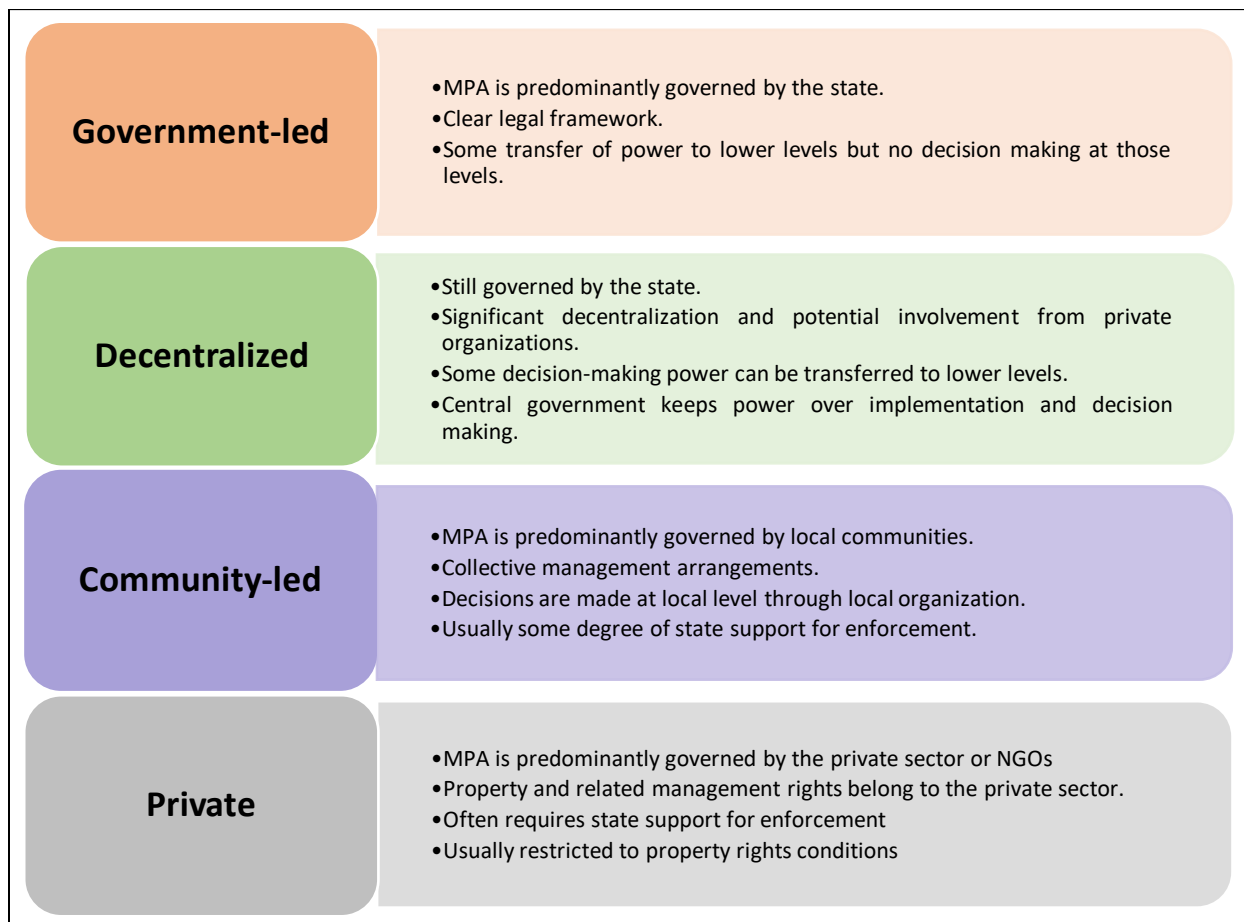


**Figure 12.** Incorporation of polycentricity in the CHG approach. Source: Jones, 2014.

#### **4.2.2 The analytical framework**

In practice, the MPAG framework helps identify the types of governance present in the MPAs, as well as the incentives applied for addressing present impacts in the governance and management of the areas. The detailed information of the development and use of the framework can be found in Jones (2014) and the UN Environment guidance (2019b), however, a brief description of the framework can be described below. According to the UN Environment (2019b), the framework considers the following elements (the ones applied for the present research are mentioned in Section 3):

- The context and overall objectives of the MPAs.
- Impacts, conflicts and driving forces to be addressed by the incentives applied for the accomplishment of conservation goals.
- Governance approach: four representative types of governance are recognized (Figure 13).



**Figure 13.** Identified representative types of governance of MPAs around the world. Modified from source: UN Environment, 2019a.

- Effectiveness: The extent to what the impacts have been addressed.
- Incentives applied and required: 36 incentives within 5 categories (Table 1) are identified as the fundamental element of the MPAG framework and as inputs to the combination of the three governance approaches mentioned in the Section 4.2.1. The incentives should be specific to the context, which means that not all the incentives must be applied (UN Environment, 2019a).
- Combination and importance of the incentives.
- Cross cutting themes: role of leadership, role of non-governmental organisations, and equity issues.

**Table 1.** Incentive categories of the MPAG framework (economic, communication, knowledge, legal and participation) with 36 identified incentives. Modified from source: UN Environment, 2019a.

Incentive Category	Incentive	Governance approach
<b>ECONOMIC</b>	<ol style="list-style-type: none"> <li>1. Payments for ecosystem services</li> <li>2. Assigning property rights</li> <li>3. Reducing the leakage of benefits</li> <li>4. Promoting profitable and sustainable fishing and tourism</li> <li>5. Promoting green marketing</li> <li>6. Promoting diversified and supplementary livelihoods</li> <li>7. Providing compensation</li> <li>8. Investing MPA income//funding in facilities for local communities</li> <li>9. Provision of state funding</li> <li>10. Provision of NGO, private sector and user fee funding</li> </ol>	Markets approach
<b>COMMUNICATION</b>	<ol style="list-style-type: none"> <li>11. Raising awareness</li> <li>12. Promoting recognition of benefits</li> <li>13. Promoting recognition of regulations and restrictions</li> </ol>	Supports all three approaches
<b>KNOWLEDGE</b>	<ol style="list-style-type: none"> <li>14. Promoting collective learning</li> <li>15. Agreeing approaches for addressing uncertainty</li> <li>16. Independent advice and arbitration</li> </ol>	Supports all three approaches
<b>LEGAL</b>	<ol style="list-style-type: none"> <li>17. Hierarchical obligations</li> <li>18. Capacity for enforcement</li> <li>19. Penalties for deterrence</li> <li>20. Protection from incoming users</li> <li>21. Attaching conditions to use and property rights, decentralization, etc.</li> <li>23. Clear and consistent legal definitions</li> <li>24. Clarity concerning jurisdictional limitations</li> <li>25. Legal adjudication platforms</li> <li>26. Transparency, accountability and fairness</li> </ol>	State approach/top-down
<b>PARTICIPATION</b>	<ol style="list-style-type: none"> <li>27. Rules for participation</li> <li>28. Establishing collaborative platforms</li> <li>29. Neutral facilitation</li> <li>30. Independent arbitration panels</li> <li>31. Decentralizing responsibilities</li> <li>32. Peer enforcement</li> <li>33. Building trust and the capacity for cooperation</li> <li>34. Building linkages between relevant authorities and user representatives</li> <li>35. Building on local customs</li> <li>36. Potential to influence higher institutional levels</li> </ol>	People approach/bottom-up

### **4.2.3 Application to the study case**

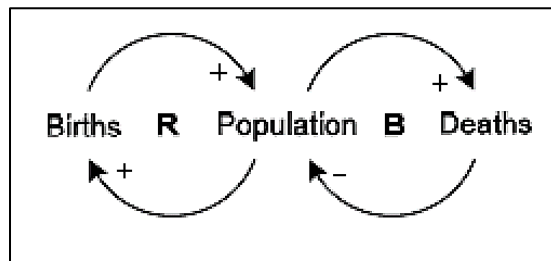
I deem this framework to be favorable for the study of governance and management of MPAs, as it takes an approach that suits the current global dynamics in terms of society, markets, and environment, aiming for sustainable SESs through a social and behavioural change. Moreover, not only does it allow to see governance and management through the interaction of different levels of governance with the identification of empirical transdisciplinary incentives, but it considers the complex ecological and social processes and dynamics of the marine environments under protection, which are historically less studied and more challenging for management in comparison to land-based ones (Jones, 2014). As Gilek, et al. (2016) state, marine governance is usually comprised of complex multi-level and multi-sectoral interactions, where in the specific case of the Baltic Sea and HELCOM, it requires simultaneous studies of these interactions to recognize the governance processes and outcomes of this region. Finally, the application of this approach helps question the implementation of marine protection as tools for conservation (Bennett, 2015) under particular geographical spaces that require a broader view in terms of connectivity and biological and social interactions, such as the HELCOM MPA network. This is necessary for the achievement of resilient societies and ecosystems that consequently contribute to the accomplishment of national and international targets for marine conservation.

In terms of a legal frame for my case study, the MPAG outcomes have been used as the foundation for governance to contribute to the SDG 14.5 (UCL, 2020) that, as mentioned before, shares objectives with the global Aichi Biodiversity Target 11 and the Milestone Target on the Protection of Land Areas, Freshwater Areas, and Marine Areas in Sweden. For this reason, I consider the implementation of this framework to the case of the HELCOM MPAs in Skåne, looking at specific characteristics of governance and management in MPAs, to be coherent with the international and national decisions and commitments that apply to these areas in Sweden.

### **4.3 The Systems Thinking approach**

Although the MPAG framework takes into consideration the connection between the incentives within the mentioned 5 categories, it does not incorporate an explanation for the analysis of the interconnection and relationship between the incentives (Bennett, 2015). For this reason, I consider the incorporation of the Systems Thinking approach appropriate for understanding the interrelation of underlying structures (Richmond, 1994) and apparent isolated elements that, when integrated, form complex systems with a function (Haraldsson, 2004).

As mentioned by Haraldsson (2004), the Systems Thinking approach helps analyse and deal with issues within complex systems through the modeling of CLDs as visualization tools. The use of CLDs facilitates the identification of the causal relations between the elements and the display of their complex dynamics and interactions within the system (Lopez, 2019; Bala, Arshad, & Noh, 2017). According to Haraldsson (2004) the development of a CLD consists in setting the systems boundaries in terms of scale (e.g. geographical scales), defining the problem and the question to answer (problem identification and model conceptualization), understanding the complexity of the system (where generalization is usually vital for choosing the elements), and developing of the visualization model. In the model, the arrows show the “causality”, and the signs show the polarity for the change in the same direction (+), or in the opposite direction (-); creating reinforcing/balancing (R)/(B) loops depending on the polarity of the feedback (Figure 14).



**Figure 14.** Example of reinforcing and balancing loops based on the polarity of the arrows in the loop. Adopted from source: Haraldsson, 2004.

## 5 Results and analysis

### 5.1 Governance and management structure

The current environmental governance in the HELCOM MPAs in Skåne is influenced by a network of international and national governance arrangements and procedures in a multilevel and a multisectoral way (Figure 15). This network is involved in the development of policy instruments that incorporate frameworks, directives, goals and/or agreements (summarized in Appendix B (Table 3)), influencing national and regional decisions for the application of strategies for marine conservation within a specific network of MPAs in the Baltic Sea (Gilek, et al., 2016). Sections 5.1 and 5.2 will address RQ1.



### ***5.1.1 International level***

Internationally, the United Nations Convention on the Law of the Sea (UNCLOS) establishes sea boundaries, navigational rights, and protection of the marine environment, for the protection and preservation of the seas under a legal framework (UN, 2012). Moreover, the Convention of Biological Diversity with the Strategic Plan for Biodiversity 2011-2020 has set 20 Aichi Biodiversity Targets, offering a framework for global conservation, protection, and use of biodiversity (CBD, 2020), where the Target 11 is included for marine protection (CBD, 2010). Finally, the 2030 Agenda for Sustainable Development has also included goals for international marine conservation, such as the SDG 14, with a management for natural resources with participation and use of local knowledge (UN, 2015).

### ***The European Union***

In the EU, the establishment of the Birds Directive (2009/147/EC) and the Habitats Directive (92/43/EEC) in accordance to the EU Biodiversity Strategy to 2020 (European Commission, 2011) sets the legal standards for the protection of wild birds, habitats, and threatened species for a favourable conservation status for protected areas across Europe by 2020 (Sundseth, 2014). For this, the Natura 2000 Network has been developed under these directives, currently covering almost 10% of the marine area in Europe, contributing to the global coverage protection by 2020 (European Commission, 2019b). Additionally, the EU Marine Strategy Framework Directive (MSFD) includes the designation and management of MPAs, as vital contributions for the achievement of a GES of the marine areas in Europe by 2020 (Directive 2008/56/EC). The MSFD, along with the Birds and Habitats Directives, represent the environmental cornerstone of the EU's Integrated Maritime Policy (COM/2009/0536), for collaboration and coordination of interlinked economic activities, fostering sustainable development in the EU's marine environment (European Parliament, 2020).

For the achievement of this in the Baltic Sea, the EU Strategy for the Baltic Sea Region, includes objectives for strengthening cooperation by introducing an environmental legislation for the marine environment and industries involved. This strategy considers the goals for 2021 according to the BSAP for HELCOM, mentioning the establishment of an ecologically coherent network of MPAs and a sustainable use of resources for a healthier marine ecosystem in the Baltic Sea (COM/2009/248).

## **HELCOM**

HELCOM stands as the “governing body” in charge of the regional environmental policy making of the Baltic Sea Area (HELCOM, 2020a), being considered the first regional sea agreement for marine conservation. HELCOM offers policies and instruments and the implementation of 260 HELCOM Recommendations by the 10 contracting parties through their national legislation (HELCOM, 2020e), as well as the mentioned BSAP for the management of the region (Valman, 2014). According to HELCOM (2016), the HELCOM MPAs network is a priority measure and a valuable instrument for the achievement of a GES under the HELCOM Recommendation 35/1. Although potentially harmful human activities can be regulated in the HELCOM MPAs through unique management plans (HELCOM, 2020c), HELCOM MPAs still depend on national or EU protection designations (e.g. Natura 2000 Network) since they do not include a legal protection themselves (WWF, 2016). However, while the Natura 2000 areas can contain terrestrial areas, protecting habitats and species that are relevant at an EU level, the HELCOM MPAs are uniquely confined to coastal and marine areas, aiming to protect the habitats and species present in this regions specifically for the Baltic Sea (HELCOM, 2020c).

### **5.1.2 National level**

As a Member State of the EU and a contracting party of the HELCOM, Sweden has committed to the participatory approach through the mentioned international agreements (Hovik, Sandström and Zachrisson, 2010), integrating them in the Sweden’s Environmental Objectives and the Milestone Targets (SEPA, 2018). Moreover, through the Bill 2008/09:170 in the Marine Policy Bill (2009), the intention for contributing to HELCOM for regional cooperation and the achievement of a GES of the Baltic Sea has been nationally incorporated along with the HELCOM MPA network under assistance of the Swedish legislation and coordination with the EU’s Natura 2000 network (CAB Skåne, 2019). The ME is a key actor for marine conservation and designation of MPAs at a national level under the Swedish Environmental Code (SEC) (Ds 2000:61), offering a legislative framework with rules, guidelines and penalties for environmental protection and management of natural resources, and being complemented by acts and codes, for instance, the Planning and Building Act (ME, 2001). For the HELCOM designation, the ME has the final decision for the implementation of these areas under the selection criteria for HELCOM and the policy framework previously mentioned (I-9). In Sweden, the Natura 2000 areas and the Nature Reserves are regulated under the SEC, and the management for the HELCOM MPAs is included in the Natura 2000 plans (I-1 & I-2), with information from the Nature Reserves designation (CAB Skåne, 2018b).

### **5.1.3 Subnational level**

On the subnational level, SEPA is responsible for the national coordination of land-based and interlinked areas (land and water) for hazardous substances and marine litter, and the collection of management plans and decisions from the CABs of all types of protected areas in Sweden (SEPA, 2020). On the other hand, SwAM is the responsible authority for the national management of water-based areas (SwAM, 2018), taking care of central questions and providing guidelines to the CABs (based on instructions from the ME for the achievement of national goals) for the management implementation of MPAs, including the HELCOM MPAs (I-1, I-2 & I-9). Regulations regarding activities such as fishing, hunting, and other economic activities are also decided by SwAM with assistance from the SEC (CAB Skåne, 2019).

### **5.1.4 Regional Level (County)**

Nationally, each CAB in Sweden is responsible for the management of the MPAs, including the HELCOM MPAs of their region (I-1 & I-2). In Skåne, the CAB Skåne is the direct responsible for the management and monitoring of the four HELCOM MPAs. According to the SEC (Ch.7, Sect. 10), the CAB Skåne is in charge of the development of proposals under the EU or national legislation, and the elaboration of specific management and conservation plans for the achievement of national and international objectives. The proposals and plans are sent to SwAM for approval (I4 & I-5) and to local levels for comments or appeals (CAB Skåne, 2019).

### **5.1.5 Local level**

According to the CAB Skåne (2020a), municipalities receive instructions from the regional authority for the application of the conservation strategies and the administration of the areas along with the landowners involved. The CAB Skåne and the municipalities spread the information within the local level with non-profit organisations (NGOs) and user representatives for further replies with comments and appeals for proposals or decisions to the CAB Skåne (I-10). Some of the most influential NGOs in Skåne, is the Swedish Society for Nature Conservation with a regional association in Skåne and local associations such as the FNF. Other organizations involved can be from economic sectors such as the SFPO for small-scale fisheries in Sweden, with a local association in Skåne.

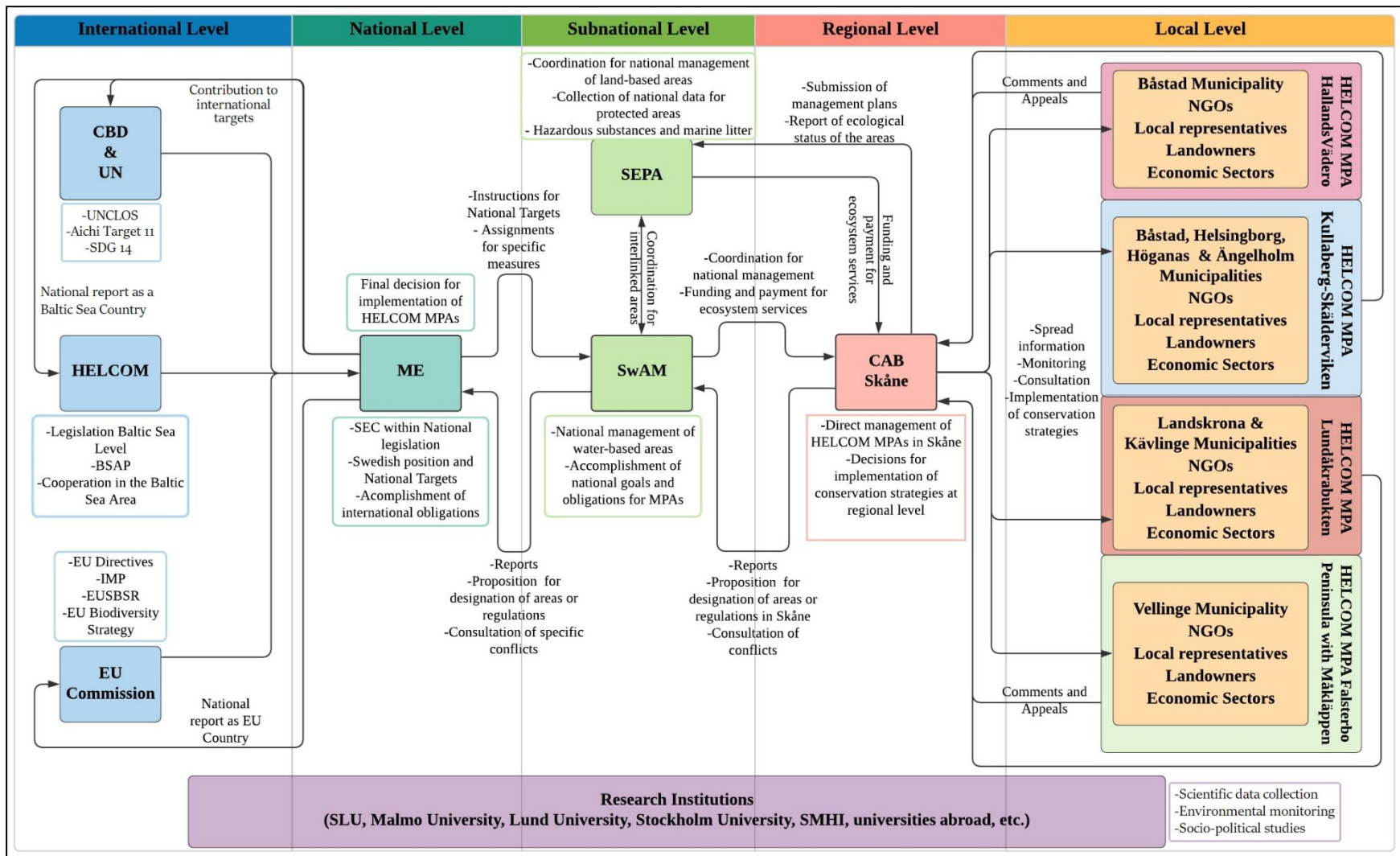


Figure 15. Governance and management structure of the HELCOM MPAs in Skåne. Author's image. Diagram developed in Lucidchart.

## **5.2 Governance characterization**

According to the governance structure mentioned in the section 5.1 and based on the governance classification of the MPAG framework, the governance characterization in the HELCOM MPAs in Skåne seems to be in a transition from government-led to decentralized governance. Under this idea, the governance and management of these areas is carried under a clear legal framework with a certain control from the central government. However, some power has been clearly delegated to lower levels, mainly the sub-national (SwAM and SEPA) and regional levels (CAB Skåne). As mentioned before, even when the local levels are given certain responsibilities and are allowed to submit comments and appeals for amendments, the decision making is not extended to this level.

## **5.3 Incentives**

### ***5.3.1 Objectives, threats, and impacts***

In Skåne, the four HELCOM MPAs are also established as Natura 2000 areas and Nature Reserves (I-4 & I-5), with overlapping objectives and conservation strategies based on the ecological and cultural values of the areas (context and overlapping areas available in Appendix C (Table 4; Figures 21-24)). However, there are shared objectives under these designations for the achievement of national and international goals.

The overall objective for these areas is to maintain the conditions for biodiversity as well as a favorable status for species and habitats included in the national and international networks of MPAs, which allow disturbance-free environments under protection, in order to preserve natural and cultural values in the long term (CAB Skåne, 2017a, 2017b, 2018a, 2018b, 2018c). Nevertheless, we can also find common threats and impacts that reflect conflicts between conservation and use of the resources (Table 2).

In this and the next sections of the results, RQ2 (Sections 5.3.1 and 5.3.2) and RQ3 (Sections 5.3.3 and 5.3.4) will be addressed.

**Table 2.** Common impacts and threats present in the HELCOM MPAs in Skåne (CAB Skåne, 2017a, 2017b, 2017c, 2017d, 2018a, 2018b, 2018c, 2019).

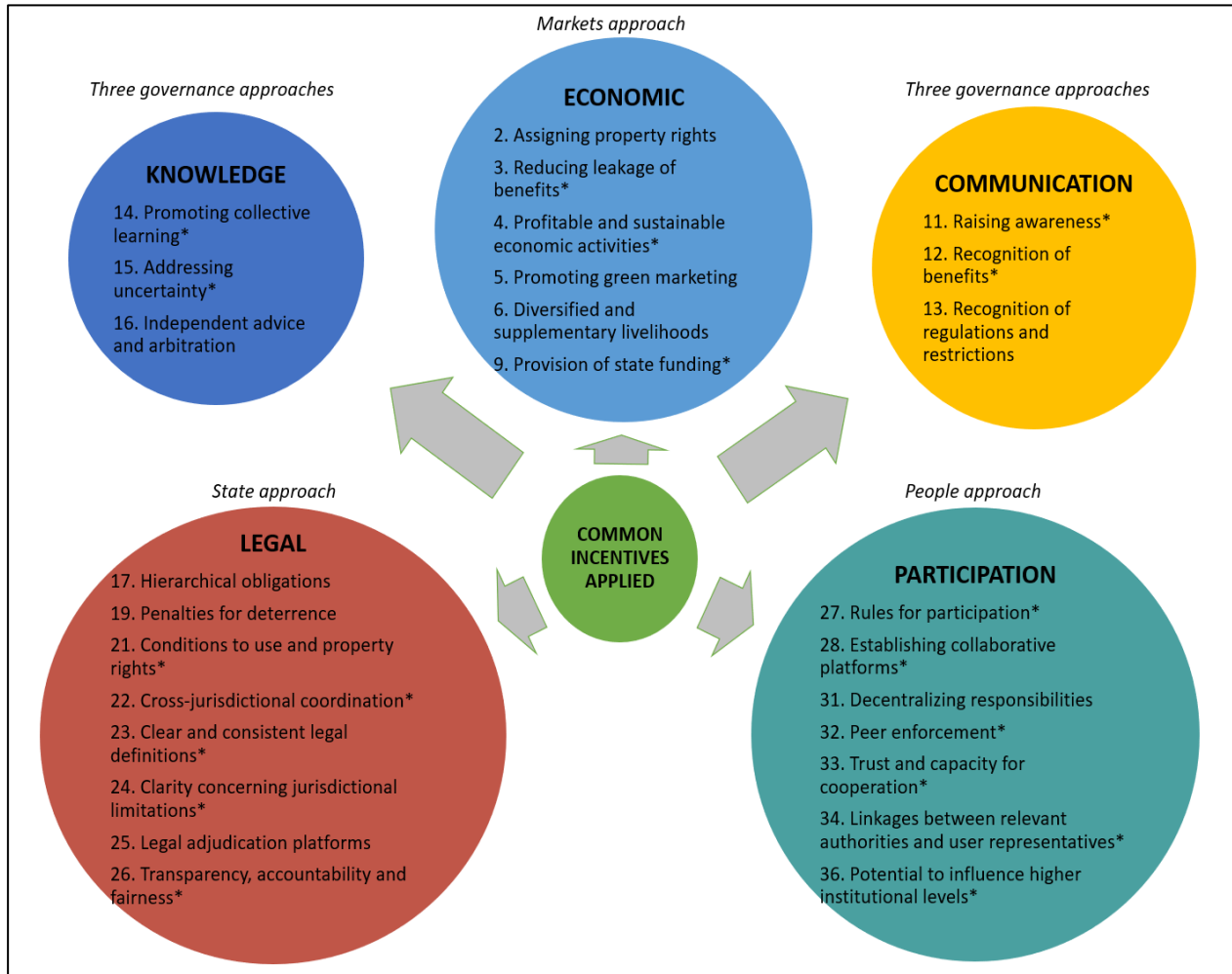
Threats	Impacts
Exploitation	Destruction of habitats and change of hydrology. Impacts in seals, seabirds and porpoises.
Eutrophication	Algae overgrowth, habitat loss, oxygen depletion and nutritional impacts.
Underwater noise and light pollution	Disturbance of several species in the food chain, specially sea birds and porpoises. Disturbance of migratory birds and nigh life.
Environmental toxins	Poisoning, genetic, and reproductive disorders. Impact on top predators affecting trophic cascades.
Oil leakages	Change of hydrology and death of species.
Littering, fishing gears and nets (Figure 16a)	Animals get caught and drawn
Wind power plants	Long-term impacts in bird habitats, risk of collision.
Sand Extraction	Habitat loss or modification in biophysical characteristics of shallow wintering, resting and breeding areas.
Outdoor activities: wind and kite surfing (Figure 16b), horse riding, uncoupled dogs.	Disturbance and abandonment of breeding places. Impact in nesting and hatching success of species.
Commercial fishing and bycatch	Depletion or changes in fish stock, impact in trophic cascades.
Fragmentation and decrease of connectivity	Edge effect and limitation of dispersal ability. Marginalization of species, high competence, and genetic disorders
Tourism	Loss of habitats, disturbance of seabirds.
Hunting	Disturbance of migratory birds and breeding, resting and feeding habitats.
Under or overgrazing	Habitat loss, reduction of shelter areas and breeding processes.
Construction (roads and facilities)	Alteration of migration routes and death of species.
Shipping and other motor vehicles	Turbulence, destruction of breeding habitats, stress of fish and bird species.
Introduction of invasive species	Displacement of species and change of ecosystems.



**Figure 16.** Examples of threats in the HELCOM MPAS in Skåne: a) abandoned nets in Hallands Väderö, b) kitesurfing in Falsterbo Peninsula with Måkläppen. Author's image.

### 5.3.2 Incentives applied

As it is denoted in Figure 17, a diverse set of common incentives has been applied in the HELCOM MPAs in Skåne. However, several incentives need reinforcement or improvement, presenting gaps and challenges in the process of implementation (Section 3.3.3).

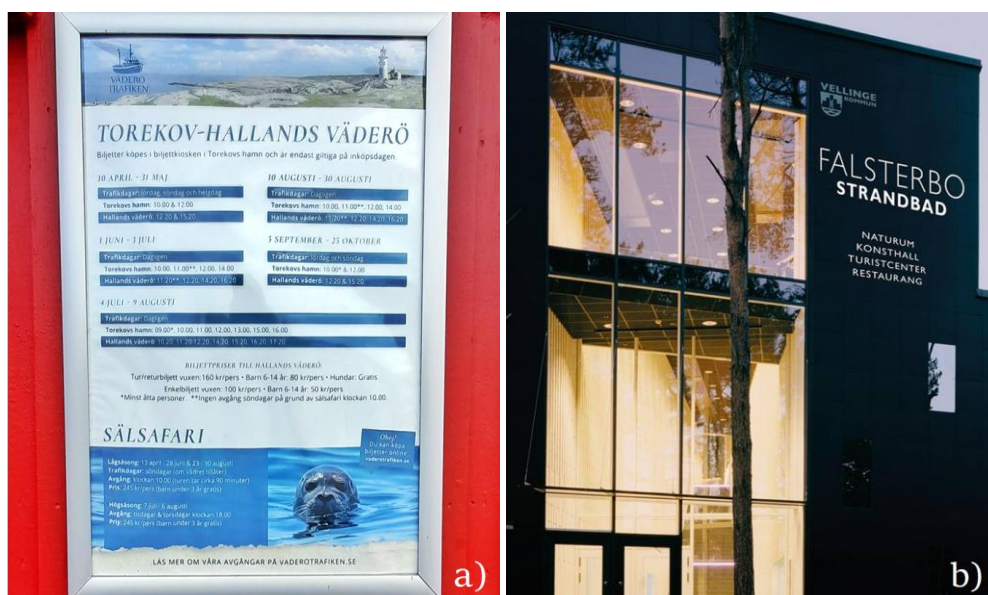


**Figure 17.** Common incentives applied in the HELCOM MPAs in Skåne within the three governance approaches. The incentives marked with (\*) indicate a need of reinforcement explained in Section 5.3.3. The numeration of incentives goes according to the MPAG framework’s list. Detailed information of each incentive in the four areas can be found in Appendix D (Table 6). Author’s image.

## Economic

In the economic category, the assignment of property rights for landowners has been applied under the SEC and through the right for appeal or requests for amendments on decisions. Moreover, a reduction of leakage of benefits has been possible through the allocation of economic activities for local people. Profitable and sustainable activities (not only tourism and fisheries) with seasonal entrance to vulnerable areas, speed limits, and restriction of activities to more resistant areas have also been promoted (I-4 & I-5) along with green marketing for ecotourism locations such as Naturums (visitor centres) in Kullaberg-Skälderviken and Falsterbo Peninsula with Måkläppen (Figure 18b). With this, an endorsement of diversified and supplementary livelihoods with economic development opportunities such as accommodation, hiking trails, tours, and local restaurants, has also been implemented (Figure 18a). Finally, state funding has been transferred to subnational (SEPA and SwAM) to regional and local levels (CAB Skåne) for the management of these areas (I-4-6 & I-9). According to the ME (I-9):

*“We make sure that the authority the SwAM gets enough funding to do assessments... and it is also the municipalities and the CAB who do that, so to make sure that they get enough, as much financing as possible to improve the knowledge base really.”*



**Figure 18.** Example of economic activities: a) Transportation to the island and Seal safari in Hallands Väderö; b) Naturum Cultural and Tourist Centre in Falsterbo Peninsula and Måkläppen. Sources: a) Author's image; b) <https://vellinge.se/en/falsterbo-strandbad/tourist-center/>



## Communication

In terms of communication, there is overall a high recognition of regulation and restrictions in the four areas. The way of raising awareness and recognition of benefits, regulations, and restrictions, has been through online information on governmental and non-governmental institutions' websites, such as SEPA, CAB Skåne, municipalities, the Nature Conservation Society and other institutions for specific sectors (e.g. Naturums for tourism, and SFPO for fisheries). Moreover, implementation of signalling with maps included (Figure 19), and information in all the management and conservation plans has been consistently incorporated in the four HELCOM MPAs under the instructions of SwAM following the SEC.



**Figure 19.** Examples of signalling with information, maps and restrictions in: a) Lundåkrabukten and b) Kullaberg-Skælderviken “Bird protection. Entrance forbidden all year”. Author’s image.

## Knowledge

Regarding knowledge, collective learning, addressing uncertainty, and independent advice and arbitration have been implemented through: marine spatial plans (I-9), LIFE Projects such as the BushLife for vegetation measures in Hallands Väderö (CAB Skåne, 2018d), advice from societies like the Skåne’s Ornithological Society in Lundåkrabukten (CAB Skåne, 2017c), and monitoring and inventories in Kullaberg-Skælderviken (EnetjärnNatur AB, 2018; Göransson, 2018), and Falsterbo Peninsula with the MARMONI project (CAB Skåne, 2018a). Moreover, excursions have also been arranged by Naturums in different historical areas of the MPAs, and additionally by NGOs with educational institutions, for example, the Marine Centre in Malmö with the FNF (I-10).

## **Legal**

In the legal aspect, the definitions are overall clear and consistent in terms of objectives of the areas, restrictions, and jurisdictional boundaries with hierarchical obligations across the levels (as indicated in section 5.1). Moreover, cross-jurisdictional coordination and clarity concerning jurisdictional limitations are considered, for example, between SEPA and SwAM for interlinked land- and water-based areas (I-8) or among other sectors such as shipping or fisheries (I-9). According to SEPA (I-8):

*“As soon as we get a document, we try and comment on it, we look who is the responsible... or sometimes obviously is both, because you have sort of different areas within one document, and then we try and do a joint response that is then sent in to the Ministry of the Environment”.*

Apart from this, penalties for deterrence and conditions for property rights are assigned according to the SEC (Ch. 29 & 30; Ch.7, Sect. 6 & 25) as the means by which the application of legal adjudication platforms such as the Environmental Court and appealing guidelines (Ch. 18-21), is possible. Finally, transparency, accountability, and fairness are demonstrated through the access of all the documents such as management plans, proposals, and decisions for possible amendments of regulations mainly on the SEPA’s official website. As SwAM mentions (I1 & I-2):

*“All the regulations and the decisions from the protected areas, can be found in SEPA. There is at least one way where you can access all the decisions.”*

## **Participation**

For participation, several incentives have also been implemented. The rules of participation, decentralization of responsibilities and the potential to influence higher institutional levels are briefly explained in the sections 5.1 and 5.2. In addition, collaborative platforms have been established among the national, subnational, and regional level (I-1, I-2, & I-4-6), and in some areas, within the local level through invitations from local representatives to politicians in municipalities (I-4, I-5, I-10 & I-11). For instance, SFPO Skåne has mentioned (I-11):

*“We try to inform politicians because many politicians don't know much about fishing. So, SFPO need to invite them and tell them about how fishing works.”*

In addition, collaboration between subnational and regional levels has been strengthened the last couple of years with constant dialogue for building trust and capacity for cooperation (I-1, I-2, & I-6). Moreover, meetings have also been arranged among these levels with some local actors involved. For example, Höganäs and Båstad municipality (I-3, I-7 & I-8), the FNF (I-10), and SFPO Skåne (I-11) have declared to have overall good support from the subnational and regional authorities, building linkages with user representatives. Finally, peer enforcement has been implemented through discussions among the actors involved in regional and local levels to solve conflicts or propose amendments as CAB Skåne mentions (I-4 & I-5):

*“We have met with ornithologists, wind and kite surfers...we’ve had meetings with the fishing industry too. So, it is kind of taking and giving meetings where you present what regulations we want and then we could back in some areas maybe, and then to inform them, and in turn, they inform the people around these issues.”*

### **5.3.3 Gaps and challenges**

During the application of incentives as conservation strategies, several gaps and challenges have arisen, showing a need of interconnectedness for achieving a resilient governance and an effective management that address objectives, threats, and impacts and achieve positive social-ecological outcomes.

#### ***Economic***

Starting from the economic category, there is a contradiction in the perspectives regarding the leakage of benefits. According to subnational and regional levels (I-1, I-2, I-4 & I-5), fisheries have a high political focus in these areas, contrary to what the fisheries in Skåne have experienced where tourism is perceived as more supported (I-11), showing a lack of trust and capacity for cooperation in the participation category.

Apart from this, the promotion of profitable and sustainable activities has been consistently hindered by conflicts between the economic sectors and the regional implementation of regulations in Skåne. For example, in Lundåkrabukten, kitesurfers have expressed a lack of scientific evidence for regulations that demonstrates the impacts of kitesurfing in the species, threatening their business, and increasing risks of collisions among surfers (CAB Skåne, 2017c). Apart from this, fishing has been commonly recognized as a conflictual (I-1-6, & I-9) and negatively affected activity in all areas due to its prohibition in a large part of the protected areas (I-7 & I-11). As Båstad Municipality states (I-7):

*"It is difficult now in terms of economy, where fishermen are having trouble surviving... they find that their own possibilities to survive are getting less and less...We don't have any fishermen in Båstad that are active now...they have disappeared one after one."*

Additionally, SFPO Skåne has mentioned issues with restrictions of areas for international and national goals, and protection of seals within the HELCOM lists (I-11):

*"The idea is good to protect the areas, but the worry for us is: What does it mean to protect an area?...the seals, there are so many now...you should take care of all species but you must find some balance... I do not think that HELCOM really have understood that..."*

Finally, a lack of enough state funding has been an important gap that has affected communication and knowledge for management and monitoring, and has arisen contradictory standpoints between the national and the regional level in the CAB Skåne (I-4 & I-5):

*"There is a problem with enough money for managing...for us, money is the basis for everything because that affects how much we know or what is there to protect... how everything is linked between our natural values and what we need to do."*

### **Communication**

Following the mentioned above, communication also presents several gaps and challenges. In the HELCOM MPAs in Skåne, a lack of awareness and recognition of benefits mainly in the local levels has been consistently expressed by several actors, even the local ones (I-3-5, I-7 & I-10). As mentioned by Höganäs municipality (I-3), different interests in the areas and absence from the authorities create conflicts and reduce legal capacity for enforcement, showing insufficient linkages between actors for participation. Referring to CAB Skåne, the municipality mentions (I-3):

*"They have to make something to make them interested...to understand that this is important for them too...If you want the local politicians to understand, the state has to do more to meet here locally...you can't have a lot of goals at levels too high up, and then you have locals who are not interested."*

## **Knowledge**

For knowledge, addressing uncertainty has been commonly mentioned as a main issue. The challenges for this incentive have been mentioned in different levels. For example, in the regional level, the uncertainty for protection under a HELCOM designation and the commitment for national and international goals, has been expressed by CAB Skåne (I-4 & I-5):

*"...a challenge with the HELCOM MPAs is a challenge for us all... Because, who knows what it means...it doesn't have legal standing, so it doesn't actually mean anything... Regarding the goals, it is not as simple as 10 percent...they (MPAs) also have to be functional...We don't actually have enough knowledge of how that works...So, it is not just the lack of knowledge in the local people."*

Moreover, according to the CAB Skåne (I-6), a lack of approaches for addressing uncertainty regarding clear guidelines for the management of the HELCOM MPAs, is a current gap and a challenge related to funding issues (I-6):

*"We need clear guidelines how to work with management and we need money to execute it...the problem is that SwAM doesn't really know what to tell us to do yet."*

Ultimately, uncertainty for profitable economic activities such as the mentioned issues with kitesurfing and other sectors, such as fisheries, has also hindered trust and capacity for cooperation. As the SFPO mentions (I-11):

*"When you make a Natura 2000 area or something... we are quite afraid of, will we be allowed to fish here? It feels really unsafe what will happen...Now we don't really know what we will be able to do the next year."*

## **Legal**

In the legal category, other gaps and challenges are present for the capacity of enforcement, such as lack of resources for enforcing regulations (I-4 & I-5) and lack of specialists in some municipalities (I-3 & I-7), as mentioned by Höganäs municipality (I-3):

*"I am the only person in the municipality who is working with these things. I am not a marine biologist... The sea is just a little thing of my profession. So, I can't work so much with that question."*

Furthermore, issues related to conditions for property rights have also arisen in terms of economic resources regarding the cost of the maintenance for landowners (CAB Skåne, 2017c). Apart from this, many examples of conflicts due to difference of interests across sectors (e.g. wind power plants vs protection of biodiversity) seem to be an issue for cross-jurisdictional coordination (I-4, I-5, & I-9). Moreover, a lack of clear jurisdictional limitations and legal definitions among SEPA and SwAM, especially for interlinked areas, have led to challenges in the subnational level, and according to the CAB Skåne, confusion in the regional level (I4 & I5):

*How SwAM and SEPA have divided their responsibilities...it is a challenge and it causes problems... SEPA is in charge of everything that has to do with birds...but some of the regulations to protect sea birds have to do with fishing and that is SwAM's responsibility. That is a big problem actually.... they do not always agree on how to deal with things."*

In addition, clear and consistent legal definitions have also been experienced to be missing for the local levels (I-7 & I-10), mentioning a lack of clarity regarding the role of the municipalities in the sea (I-7), and a problem of interpretation for delimitations for activities (I-10). Additionally, transparency and accountability has been missing, especially regarding the report of the status of the areas to HELCOM (I-4 & I-5), and a consistent inclusion of specific objectives, lists of species and habitats, and incentives that are specific for the HELCOM designation within the management plans of all the MPAs in Skåne. On top of this, the exemption of activities in some areas within the MPAs has created a sense of lack of transparency from the local actors, affecting trust and capacity for cooperation in the participation category (I-3, I-10 & I-11). As an example, SFPO mentions (I-11):

*"Sometimes we get a bit frustrated when we see that other things are possible to do but not fishing...if there is a lot of money in it, sometimes they get permits to do things."*

### **Participation**

Starting from the interviews, five out of seven municipalities involved did not agree to be interviewed mentioning that they were not involved, or they had only been consulted once during the process of implementation of the areas. Moreover, from the 5 NGOs contacted, only 2 agreed to be interviewed, and the others referred to the CAB Skåne for information. This shows a lack of engagement within the local level, where the rules for participation, specifically for HELCOM, are not clearly established. Moreover, for the interviewed municipalities, both mentioned that there is rare communication among municipalities,

and that there is a lack of collaborative platforms with higher levels (I-3 & I-7), exposing a need for reinforcement of the linkages between these levels. As Höganäs municipality mentions (I-3):

*"I think the CAB Skåne has to do more, to show themselves up here in Höganäs...the politicians up here feel that CAB Skåne is seeking for their own... They are not interested in what happens here...Today I feel that between the municipality and CAB Skåne there is a wall."*

A similar issue has also been stated by SwAM within the subnational level for capacity of cooperation and peer enforcement (I-1 & I-2):

*"Collaboration between SwAM and SEPA can be strengthened. They are not that involved in our work and we are not in theirs. They are based in Stockholm".*

Finally, the potential to influence higher institutional levels presents high opportunities for improvement linked to trust and capacity for cooperation, since the local levels have expressed inconformity with the decision making process (I-10 & I-11), and the difficulty through the process of appealing as mentioned by the FNF (I-10):

*"Unfortunately, many people have the experience that it is such a laborious process to appeal and that the result of an appeal very often is zero... we don't care because we cannot do anything about it so, it is like giving up, we have no say at all."*

#### **5.3.4 Interconnectedness for improvement**

After presenting the common incentives applied and the gaps and challenges in the last sections, it is possible to mention that an important diversity of incentives as conservation strategies have been considered for the governance and management of the HELCOM MPAs in Skåne. However, it is clear that there are many areas of opportunity for improvement within the incentives applied, and most important, for their interconnectedness, which according to the theory (sections 4.1 and 4.2), it is what can lead to high complexity, consequently increasing its SER. In fact, there is a common consensus among the interviewed actors, setting the HELCOM MPAs in Skåne as an example, where the international and national conservation goals for marine protection in terms of governance and management that incorporate knowledge about the ecological and social needs of the areas, are far from being achieved under the current incentives applied for marine protection (I-1-11).

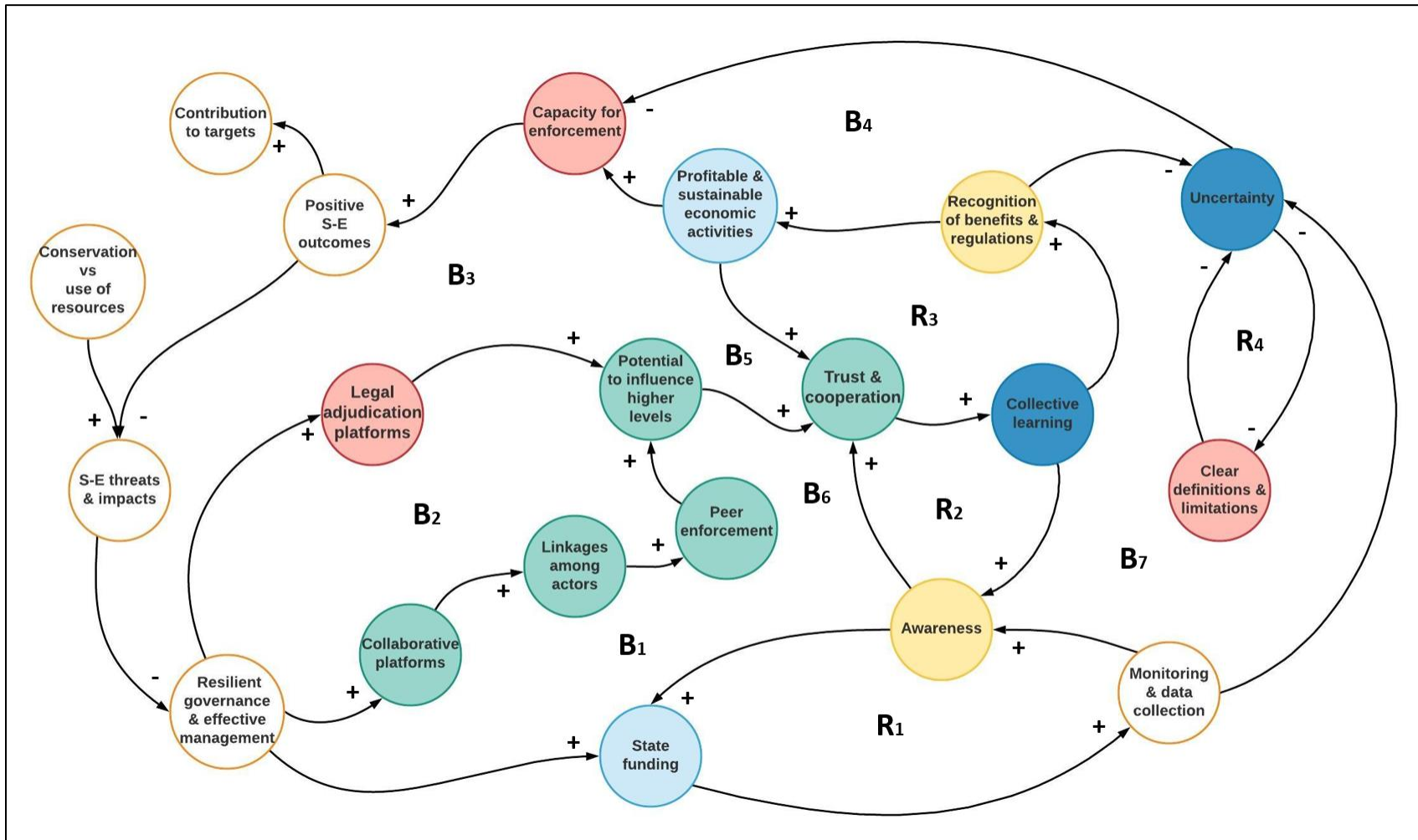
Nevertheless, with the information from the last sections of the results, it is possible to identify linkages among stressed incentives by the actors (core incentives as the main elements of the system) that affect each other in the same or different categories. Following the previous ideas, a diverse set of interconnected incentives for SER should lead to a resilient governance and an effective management for the reduction and absorption of threats and impacts due to conflicts in conservation and use of the resources. With this, positive social-ecological outcomes can be achieved, contributing to conservation goals. This will be visualized and explained through the following CLD for an improvement of interconnectedness of incentives in the HELCOM MPAs in Skåne as complex SESs (Figure 20).

Starting from the conflicts between conservation and use of resources that lead to social and environmental impacts increasing the need for a resilient governance and an effective management, the application of incentives, such as state funding and legal and collaborative platforms represent a starting point in the system. The implementation and improvement of collaborative platforms, mainly in local levels, strengthen the linkage between authorities and user representatives, leading to peer enforcement and a higher potential for influence. Along with the application of legal adjudication platforms that increase the potential to influence higher institutional levels, and a sufficient state funding for the increase of data and monitoring in marine environments and consequently awareness at different jurisdictional levels, trust and cooperation can be developed, and awareness can help facilitate and reinforce the state funding in higher levels (R1), as mentioned by SwAM (I-1 & I-2):

*“Traditionally, marine protection has always been seen as a sort of a project...what we hope, is that the government really doesn’t see it as a project, but see it as long-term investment.”*

Trust and cooperation through levels can lead to collective learning among actors to reinforce awareness (R2) and increase the recognition of benefits, restrictions, and regulations for achieving profitable and economic activities that also trust the strategies applied (R3). Moreover, the recognition of benefits and regulations added to monitoring and data collection can reduce uncertainty that allows the development and implementation of clear legal definitions and jurisdictional limitations that in turn, reduce uncertainty in a reinforcing loop (R4). By achieving sustainable economic activities, and addressing uncertainty, the increment of the capacity of enforcement can be achieved through the increase of knowledge and communication. This can finally lead to positive social-ecological outcomes that reduce and absorb future social-ecological threats and impacts (B1 - B7), and contribute to regional, national, and international conservation targets and objectives, within a whole resilient SES.





**Figure 20.** Development of the Systems Thinking's CLD tool with the core incentives for the governance and management in the HELCOM MPAs in Skåne. The CLD shows seven balancing loops and four reinforcing loops. The colour of the circles goes according to the 5 incentive categories of the MPAG framework. Light blue: economic, yellow: communication, dark blue: knowledge, red: legal, and green: participation. The white circles show the elements that lead to the application or represent the outcomes of the incentives within the system. Each loop is visually explained in Appendix E (Figures 25-27). Author's image. Diagram developed in Lucidchart.

## 6 Discussion

As mentioned before, the use of the ocean for economic activities has led to the commodification and overexploitation of resources as drivers for environmental impacts (Peet, Robbins & Watts, 2011). However, decommodification as an attempt of locally removing resources from the market through nature-based solutions for marine conservation (Gerber and Gerber, 2016) can also explain the roots of social impacts in different levels and scales as a “chain of explanation” (Robbins, 2012), bringing conflicts between conservation and use of the resources in the areas, as shown in the results.

Moreover, the use of marine ecosystems for other environmental solutions such as reduction of carbon emissions through the implementation of wind power plants in important areas for marine biodiversity conservation, creates a paradigm of “economy of repair” (Fairhead, Leach & Scoones, 2012), where some environmental issues are addressed in a national level by generating ecological impacts in a local level, even when both solutions aim for positive environmental outcomes. In an analogy, environmental goals run the risk of functioning in the same way, where in an international or Baltic Sea level, the coverage protection solely for achieving a percentage in an attempt to “solve issues” for global concerns, can create social, and even environmental impacts in local levels if this is not addressed in a way that incorporates the needs of both spheres.

One of the main critiques for the implementation of MPAs as tools for conservation, has been the setting of goals under geographical areas, by transferring land-based management paradigms to enclosed marine spaces with highly dynamic and interconnected environments, and social needs (Kearney, Farebrother, Buxon & Goodsell, 2012). Following this, it is important to question if the management of marine protected environments based on terrestrial geographical limitations, such as the county of Skåne, is the most optimal and applicable scale. This brings importance to decentralization, but mostly to collaboration among actors and institutions across jurisdictional levels and across sectors, to implement resilient governance and effective management that fit the ecosystem dynamics of the ocean. Therefore, whether MPAs are deemed to be implemented for the achievement of goals, the application of a diverse set of interconnected incentives for SER that contributes to social aspects (within different governance approaches), but also that addresses ecological needs (in terms of connectivity and coherence), become central factors. In this sense, the study of both spheres, as well as their linkages, is crucial for the achievement of resilient SESs.

Additionally, even when governance and management in HELCOM MPAs are vital, MPAs overall cannot work by themselves, since regulations and agreements across sectors and countries involved inside and outside MPAs in the Baltic Sea are critically important to include for the conservation of valuable habitats and the overall health of the region. Currently, as Gilek, et al. (2016) mention, it is highly unlikely that objectives in the Baltic Sea such as the BSAP and the MSFD, are achieved by 2021 due to environmental issues and governance limitations, which is coherent with the results in the present study. In this sense, HELCOM needs to bring importance to high, but also deeper jurisdictional levels in the countries surrounding the Baltic Sea, since signing an agreement is not enough to assume that the actions are being performed in national, regional, and local levels. Therefore, it is necessary to include the HELCOM lists and objectives in the management plans for the MPAs that are under this specific designation, even when HELCOM does not have a legal standing. If this does not happen, the designation and the protection of the habitats and species under HELCOM are at risk to become irrelevant in practice, since the goals for international collaboration and achievement of a GES do not get transferred into documents that set, and most important that reflect, the conservation strategies empirically implemented in these areas.

Finally, future initiatives, such as the EU Biodiversity Strategy for 2030 aiming for 30% of protection of the oceans around Europe by this year (European Commission, 2020), the requests for postponing the BSAP after 2021 (SwAM, 2019), and the new UK's proposal, already signed by Sweden, for a 30% of global marine protection (Swedish Government, 2020); increase the pressure for protection of the implementation of MPAs. Moreover, they arise further questions that become relevant for the scope of future conservation targets and most important, for the achievement of SER in complex SESs: How long can we prolong goals for the environment and what is the purpose behind them? Are we protecting complex marine ecosystems for political benefits through the achievement of goals? Or for allowing resilient environments that we can actually benefit from?

## **7 Conclusion**

Marine protection under environmental goals requires a resilient governance and an effective management that address social and ecological impacts and needs. In the case of the Baltic Sea, HELCOM has become a vital factor for the conservation of this region due to several environmental issues, where Sweden has become part of the regional collaboration. The HELCOM MPAs in Skåne have been implemented and managed through a process of decentralization and delegation of responsibilities with certain control from the state under a clear legal framework. Moreover, a diverse set of incentives has

been applied for the governance and management of these areas. Nevertheless, several gaps and challenges have been present throughout the process with a need for recognizing the interconnectedness of core incentives and the role of the HELCOM designation in practical cases for increasing SER.

This thesis brings importance to the study of both social and ecological spheres to question the implementation of current and future goals and targets for marine conservation, where focusing on protection coverage percentages can mislead the intention of the implementation of the areas in the first place, leading to unsustainable practices and misunderstanding of marine necessities that can generate further negative impacts in societies and environments in a long-term. Indeed, diving under protected waters for the understanding of governance and management through diversity and interconnectedness of incentives for SER within complex SESs, such as the HELCOM MPAs in Skåne, is essential for the overall health of the marine environments, and not only for the protected ones.

## 8 References

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## 9 Glossary

- **Accountability:** “the obligation to (i) demonstrate that work has been conducted in accordance with agreed rules and standards and (ii) report fairly and accurately on performance results vis-à-vis mandated roles and/or plans” (UNDP, 2008, p.4).
- **Adaptive management:** “focuses on understanding ecosystem dynamics and feeding ecological knowledge into management organizations” (Folke, Hahn, Olsson & Norberg, 2005, p. 448).
- **Connectivity:** “It measures whether a group of MPAs function as a network. Connectivity aims to ensure that species’ migrations and dispersals during different life stages is supported by the MPA network” (HELCOM, 2016, p. 33).
- **Conservation:** “the protection, care, management and maintenance of ecosystems, habitats, wildlife species and populations, within or outside of their natural environments, in order to safeguard the natural conditions for their long-term permanence” (IUCN, 2017, p.18).
- **Decentralization:** “the transfer of authority from central government to lower-level government levels, quasi-independent government organisations, NGOs or the private sector” (Jones, 2014, p.106).
- **Deconcentration:** “The transfer of power for implementing decisions, but not for making decisions” (Jones, 2014, p.106; Oxhorn, 2004).
- **Delegation:** “Transfer of some decision-making powers with a degree of control from the central government over key aspects of policy” (Jones, 2014, p.106; Oxhorn, 2004).
- **Devolution:** “The transfer of maximum feasible, but not necessarily total, decision-making powers” (Jones, 2014, p.106; Oxhorn, 2004).
- **Ecologically representative areas:** Protected area systems that “contain adequate samples of the full range of existing ecosystems and ecological processes, including at least 10% of each ecoregion within the country” (CBD, 2013, Version 2, p.23).
- **Effectively and equitably managed areas:** Areas with “planning measures in place to ensure ecological integrity and the protection of species, habitats and ecosystem processes, with the full participation of indigenous and local communities, and such that costs and benefits of the areas are fairly shared” (CBD, 2013, Version 2, p.23).
- **Effectiveness:** “the degree and extent to which the impacts of users that can undermine the fulfilment of conservation objectives are reduced, and do not take account of operational



objectives as these are considered in the MPAG framework in terms of incentives” (UN, Environment, 2019b, p.6).

- **Environmental status:** “The overall state of the environment in marine waters, taking into account the structure, function and processes of the constituent marine ecosystems together with natural physiographic, geographic, biological, geological and climatic factors, as well as physical, acoustic and chemical conditions, including those resulting from human activities inside or outside the area concerned” (Ch.1, Art. 1 (4), Directive 2008/56/EC, 2008).
- **Favourable conservation status (for Natura 200 areas):** “Ensuring that the designated habitats and species remain long-term in Europe” (CAB Skåne, 2017a, p. 2(70)).
- **Good environmental status (GES):** “the environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions, and the use of the marine environment is at a level that is sustainable, thus safeguarding the potential for uses and activities by current and future generations” (Chapter 1, article 1 (5), Directive 2008/56/EC, 2008).
- **Governance:** “A broader set of elements that includes all the groundwork through to the negotiations and discussions that underpin management and influence human behaviour. It is a continuous process that involves negotiations among people, norms of behaviour and economic influences” (UN Environment, 2019a, p.15).
- **Incentive:** “a particular governance approach that is designed to encourage people to behave in a way that supports the achievement of certain strategic policy outcomes such as, for example, biodiversity conservation” (UN Environment, 2019a, p.22).
- **Institutions:** “the prescriptions that humans use to organize all forms of repetitive and structured interactions including those within families, neighbourhoods, markets, firms, sports leagues, churches, private associations, and governments at all scales” (Ostrom, 2005, p. 3).
- **Management:** “Is a part of governance and is a formal representation of official decisions that can be readily seen, such as management plans, management groups and regulations” (UN Environment, 2019a, p.15).
- **Marine Protected Area (MPA)** (definition from Natural Protected Area suitable for terrestrial and marine areas (Grip & Blomqvist, 2018)): “A clearly defined geographical space, recognised, dedicated and managed to achieve the long-term conservation of nature, associated ecosystem services and cultural values” (Dudley & Stolton, 2008, p.125).

- **Nature-based solutions:** “Actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits” (Cohen-Shacham, Walters, Janzen & Maginnis, S, 2016, p. 2).
- **Participation:** The involvement of people in developing and implementing policies and programmes that affect them (UNDP, 2010, p.49).
- **Protection:** The prevention of alterations in the ecosystems associated with human activities and unwanted natural changes (Hamilton & Macintosh, 2008).
- **Resilience:** “determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist” (Holling, 1973, p.17).
- **Site of Community importance (SCI):** “a site which , in the biogeographical region or regions to which it belongs, contributes significantly to the maintenance or restoration at a favourable conservation status of a natural habitat type in Annex I or of a species in Annex II and may also contribute significantly to the coherence of Natura 2000 referred to in Article 3 , and / or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned (Article 1, (I), Directive 92/43/EEC, 1992).
- **Special Area of Conservation (SAC):** “a site of Community importance designated by the Member States through a statutory, administrative and/or contractual act where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated” (Article 1, (I), Directive 92/43/EEC, 1992).
- **Special Protection Area (SPA):** According to the Bird Directive (2009/147/EC), an SPA is the most suitable geographical area in number and size, for the conservation of the bird species in land- and sea-based areas where the Bird Directive applies (Art. 4 (1)).
- **Transparency:** “The right of citizens to know what public institutions are doing and how public policies and programmes are being implemented.” (UNDP, 2010, p.49).

## 10 Appendices

### 10.1 Appendix A: Interview's layout

"I would first like to ask you if I could record this interview in order to be able to check the questions for my thesis, I would respect if you want me to keep the conversation private but I want to state that it is only for academic reasons and the interview will not be mentioned by name.

As I had mentioned to you by phone, I am working on my thesis with governance and management of the HELCOM MPAs, basing this on a theoretical framework that talk about the governance and management in the HELCOM Marine Protected Areas and the incentives applied as well as the gaps and challenges that have come with the implementation of conservation strategies in these areas. I need to get information about how these conservation strategies contribute to achieve a resilient governance and an effective management in the long term.

I am focusing only on the 4 HELCOM MPAs of Skåne, but I have adjusted the questions to your level of governance. However, if you have specific answers related to the region or the areas I would really appreciate if you mention them.

QUESTIONS:

*General (as starting points):*

1. What is the role of the institution or actor in the management and governance of the HELCOM MPAs in Skåne?
2. What do you think are the main drivers affecting or hindering a resilient governance and an effective management of the HELCOM MPAs (either economic, social or political drivers)?
3. How do you think these drivers impact the intended conservation strategies for the HELCOM Marine Protected Areas?

*Communication and participation:*

4. How is the communication and the collaboration between institutions such as ME, SEPA, SwAM and other actors in the regional and local levels such as the CAB Skåne and Municipalities for the management of the HELCOM MPAs?
5. Which are the main challenges for communication and collaboration and how does this impact the management of the HELCOM MPAs?
6. Do you think there is a strong linkage among relevant authorities? What do you think should be improved?
7. Have you established collaborative platforms to improve participation and communication?

*Economic:*

- 8.** Can you visualize conflicts between conservation and use of resources in the areas? Which are the most and less conflictual economic activities for management and monitoring? Why?
- 9.** Are there specific economic challenges and impacts that you could identify in the HELCOM MPAs from the level of governance you are?
- 10.** Are there economic incentives used for conservation of these areas? E.g. funding or payment for ecosystem services)? If so, do you believe these economic incentives represent a current challenge for the management of these areas? Why?

*Legal:*

- 11.** What is the strategy for avoidance of conflicts between actors? Are there well-defined boundaries for obligations and responsibilities among them? How is this communicated?
- 12.** How have you had to deal with incoming users? For example, with immigration, increasing tourism, or fishing market forces? How to assure the benefits are distributed equitably and there are no leakage of benefits?
- 13.** Do you think there is a clear recognition of regulations, restrictions, and also of benefits in the activities performed in the HELCOM MPAs?
- 14.** Who gets to decide on these rights and sanctions in the HELCOM MPAs for avoidance of conflicts?
- 15.** Could you identify the most common social and legal conflicts when implementing and managing HELCOM MPAs? How is the institution involved for addressing these conflicts?

*Knowledge:*

- 16.** Could you say that the ecological importance of the HELCOM MPAs is lacking in lower levels including the local level? How do you think it should be improved?
- 17.** Has the institution applied or enforced strategies for increase of knowledge or awareness in these areas?
- 18.** From your perspective, what do you think is needed to influence human behaviour for long-term conservation strategies in the HELCOM Marine Protected Areas in Sweden?
- 19.** Do you think monitoring efforts should be improved in the HELCOM MPAs in Sweden?

*General (for concluding important points)*

- 20.** Summarizing, which vital gaps or factors do you perceive are missing or are needed in order to achieve an effective management and a resilient governance in the HELCOM MPAs?
- 21.** Do you think that the international and national targets such as the Aichi Biodiversity Target 11, the SDG 14.5, and the Milestone Target (which aim for a 10% of coverage protection and management effectiveness), as some examples, will be achieved with the current governance and management in the HELCOM MPAs in Sweden?

## 10.2 Appendix B: Policy instruments for marine protection

**Table 3.** Policy instruments for marine protection in the HELCOM MPAs in Skåne. Sources: A/CONF:62/122; CBD, 2010; UN, 2015; Directive 2009/147/EC, Directive 92/43/EEC; Directive 2008/56/EC; COM/2009/0248; European Commission, 2011, 2020; HELCOM, 2007; ME, 2011; SEPA, 2018; Swedish Government, 2014.

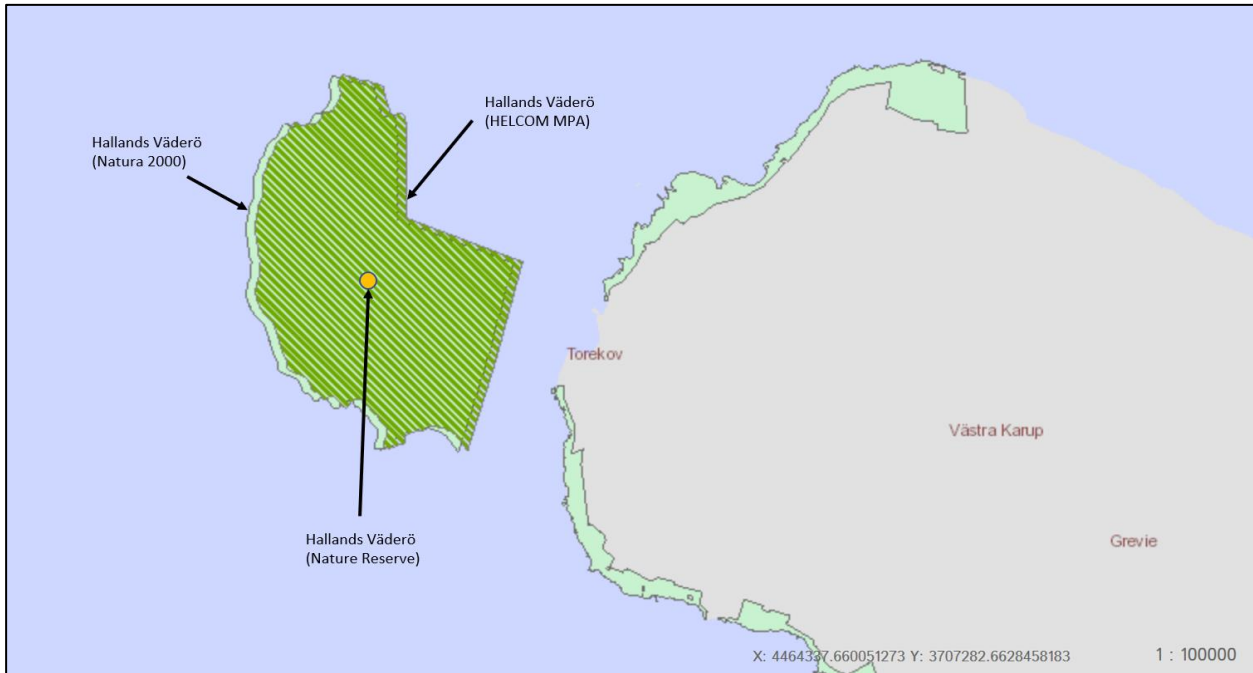
Level	Body	Year	Policy instruments	Main points for marine protection
Global	United Nations (UN)	1982	Convention on the Law of the Sea (UNCLOS)	Equitable and efficient use of marine resources, conservation of living resources, and research, protection, and preservation of the marine environment. Establishment of territorial seas and EEZs.
	Convention of Biological Diversity (CBD)	2010	Strategic Plan for Biodiversity: Aichi Biodiversity Target 11	10% coverage protection with effective and equitable management, and representative and connected systems by 2020
	United Nations (UN)	2015	2030 Agenda for Sustainable Development: SDG 14.5	10% coverage protection, national and international law consistency and effective management and regulations
European Union	European Commission	1979 & 1992	EU Birds and Habitats Directives	Protection of wild bird species, threatened and endemic species, and habitats within the European Union
		2008	Marine Strategy Framework Directive (MSFD)	Protection of the marine environment in Europe and sustainable use of marine goods. MPAs as vital contributions for “Good Environmental Status (GES)”.
		2009	European Union Strategy for the Baltic Sea Region (EUSBSR)	3 objectives: 1. Saving the sea 2. Connecting the region 3. Increasing prosperity
		2011 & 2020	The EU Biodiversity Strategy to 2020 and for 2030	Reinforce proper marine protection and restoration to achieve a “GES” by 2020. Expansion of a 30% of coherent network of MPAs by 2030.
Baltic Sea	HELCOM	2007	Baltic Sea Action Plan (BSAP)	“GES” by 2021 Collaboration between countries in the Baltic Sea Area Four key themes: eutrophication, hazardous substances, maritime activity, and biodiversity
Sweden	Ministry of the Environment (ME)	1998	Swedish Environmental Code (SEC)	Guidelines, rules, and penalties for management of natural resources and protection of the environment
		2008	Sweden’s Environmental Objectives	Milestone Targets and 16 Environmental Quality Objectives for major environmental issues by 2020. Inclusion of a goal for a balanced Marine Environment, Flourishing Coastal Areas and Archipelago. Proposal for funding and creation of a national network of MPAs.
		2013	Milestone Target on the Protection of Land, Freshwater and Marine Areas	Protection of at least 10% of marine areas in Sweden by 2020 for contribution with international and national conservation and biodiversity targets.

### 10.3 Appendix C: Context of HELCOM MPAs in Skåne

**Table 4.** General information of the HELCOM MPAs in Skåne. N2000=Natura 2000 area; SPA=Special Protection Area (under the Birds Directive); SAC= Special Area of Conservation, pSCI= proposed Site of Community Importance, and SCI= Site of Community Importance (all three under the Habitats Directive). \*= Year of designation acquired from HELCOM (2020) but not present in the management plans (only the conservation plan of Lundåkrabukten mentions the year of designation for HELCOM). \*\*= The conservation plan of FM is the only or all the HELCOM MPAs in Skåne that includes HELCOM lists and reports for this area. Sources: CAB Skåne, 2017a, 2018a, 2018b, 2018c, 2019; HELCOM, 2020d.

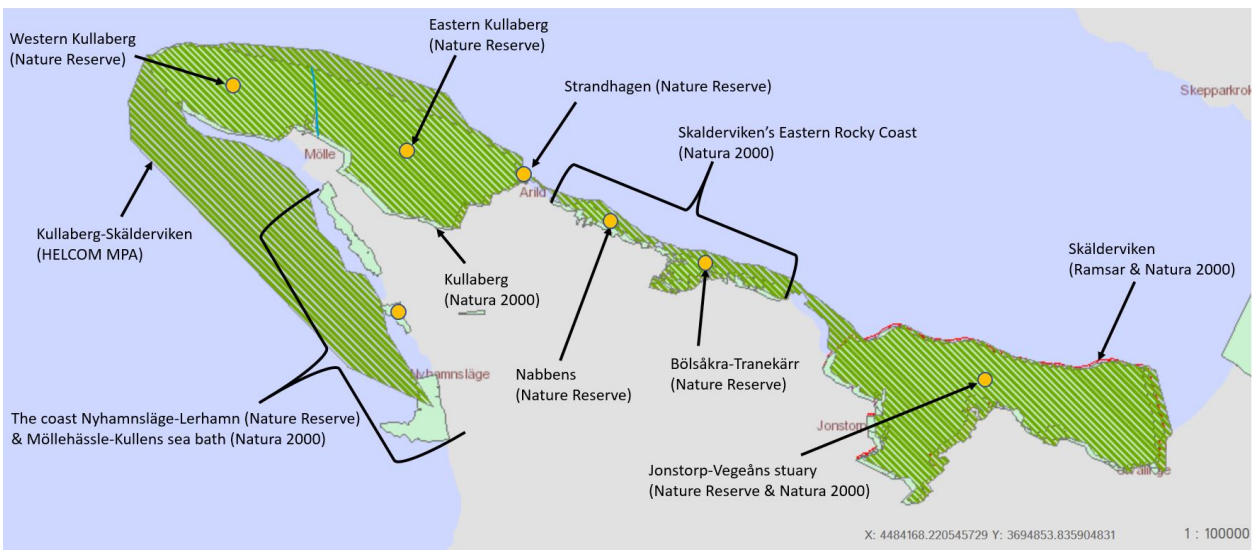
Name	Type of designation	Year of designation	Area (ha)
<b>Hallands Väderö</b>	Nature Reserve (NR) N2000: (pSCI & SPA, SCI/SAC) HELCOM MPA 194	NR: 1958 and 1998 N2000: 1996, 2004/2011 HELCOM MPA: 2008*	NR: 1834.4 N2000: 1834.4 HELCOM MPA:1834.4
<b>Kullaberg-Skälderviken (K-S)</b>	Nature Reserve (NR) N2000: (K: pSCI, SCI, SAC; K-S: SPA) Ramsar (RAM) HELCOM MPA 112	NR: K:1965,1971,2004 N2000: K: 1995,1997, 2004, 2011; K-S: 1996-1998 RAM: S: 2001 HELCOM MPA: K-S: 2008*	NR: K: ~1353.8 N2000: K: ~1358; S: 1509.9 RAM: S: 1463.1 HELCOM MPA: 4514.9
<b>Lundåkrabukten</b>	Nature Reserve (NR) N2000 (SPA, SCI) Ramsar (RAM) HELCOM MPA 193	NR: 1950, 1972, 2017 N2000: 2000, 2004 RAM: 2001 HELCOM MPA: 2006	NR: 3689.9 N2000: 2098.4 RAM: 2148.3 HELCOM: 1959.3
<b>Falsterbo Peninsula with Måkläppen (FM)**</b>	Nature Reserve (NR) N2000 (pSCI, SCI, SAC) HELCOM MPA 111	NR: F: 2011; M: 1984 N2000: F: 1997, 2004, 2011 HELCOM MPA: 2008*	NR: F:41398.6; M:765.3 N2000: F: 42345 HELCOM MPA: 46358.2

Overlapping designations with the HELCOM MPA Hallands Väderö:



**Figure 21.** Overlapping areas under different EU and national protection designations with the Hallands Väderö HELCOM MPA. The striped area shows the area designated as HELCOM MPA, the areas in light green show the Natura 2000 areas, and the yellow dot shows the location (but not the area covered) of the Nature Reserves within the Natura 2000 areas. Modified from source: HELCOM, 2020b; SEPA, 2020.

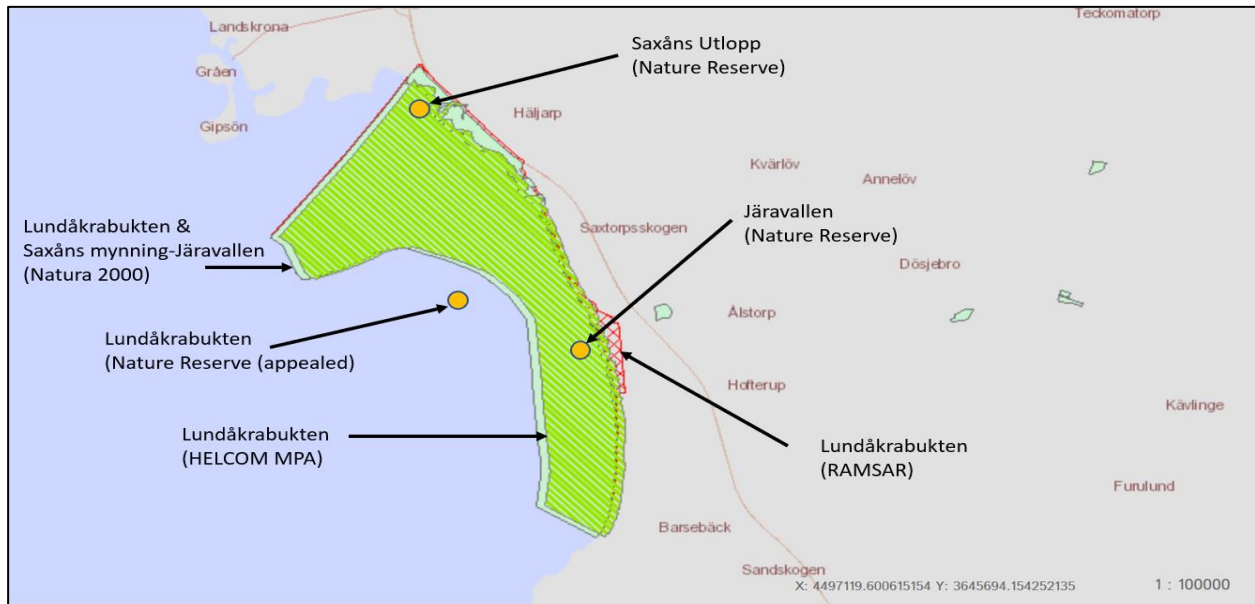
Overlapping designations with the HELCOM MPA Kullberg-Skälderviken:



**Figure 22.** Overlapping areas under different EU and national protection designations with the Kullberg-Skälderviken HELCOM MPA. The striped area shows the area designated as HELCOM MPA, the areas in light green show the Natura 2000 areas, the area delimited in red shows the Ramsar area, and the yellow dots show the location (but not the area covered) of the Nature Reserves within the Natura 2000 areas. Modified from source: HELCOM, 2020b; SEPA, 2020.

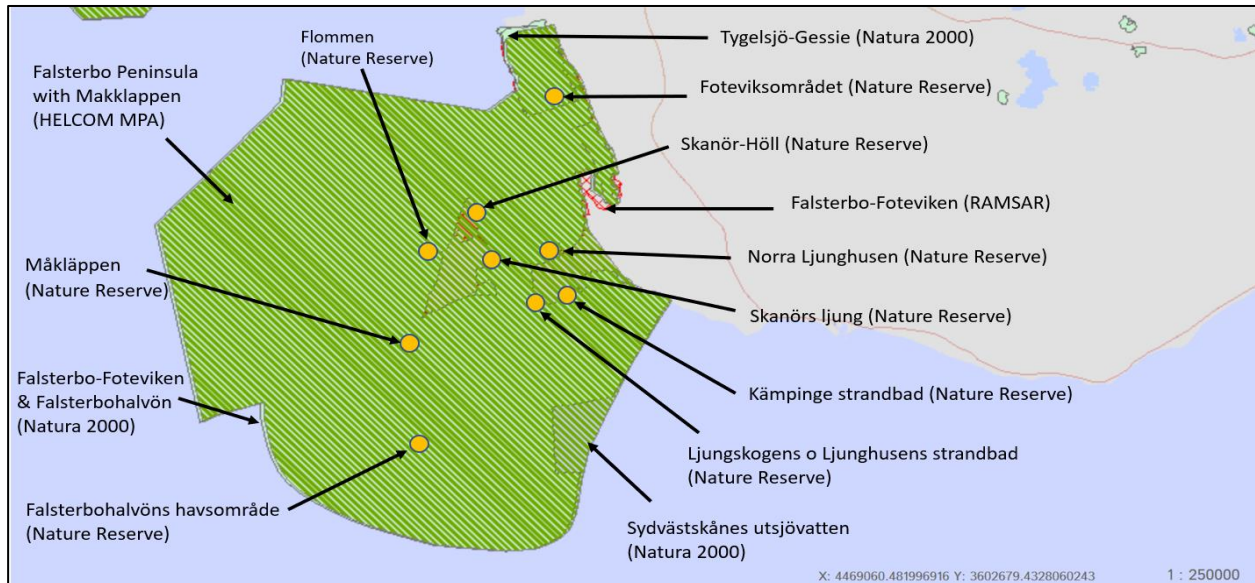


Overlapping designations with the HELCOM MPA Lundåkrabukten:



**Figure 23.** Overlapping areas under different EU and national protection designations with the Lundåkrabukten HELCOM MPA. The striped area shows the area designated as HELCOM MPA, the areas in light green show the Natura 2000 areas, the area delimited in red shows the Ramsar area, and the yellow dots show the location (but not the area covered) of the Nature Reserves within the Natura 2000 areas. Modified from source: HELCOM, 2020b; SEPA, 2020.

Overlapping designations with the HELCOM MPA Falsterbo Peninsula with Måkläppen:



**Figure 24.** Overlapping areas under different EU and national protection designations with the Falsterbo Peninsula with Måkläppen HELCOM MPA. The striped green area shows the area designated as HELCOM MPA, the areas in light green show the Natura 2000 areas, the area delimited in red shows the Ramsar area, and the yellow dots show the location (but not the area covered) of the Nature Reserves within the Natura 2000 areas. Modified from source: HELCOM, 2020b; SEPA, 2020.

## 10.4 Appendix D: Incentives applied, gaps, and challenges of HELCOM MPAs in Skåne

**Table 5.** Summary of incentives applied in the HELCOM MPAs in Skåne with conflicts and challenges according to the MPAG framework. HV= Hallands Väderö, K-S= Kullaberg-Skålderviken, L= Lundåkrabukten, FM= Falsterbo Peninsula with Måkläppen. The dots indicate where the incentives are applied.

Incentives	Summarized application of the incentives	Incentives applied in HELCOM MPAs Skåne				Gaps and challenges
		HV	K-S	L	FM	
1. Payments for ecosystem services	Payment for ecosystem services is not applied since waters are owned by the state (CAB Skåne, 2018a)					Not a clear picture of PESs in marine areas (I-9).
2. Assigning property rights	Landowners have the right to comment and propose for decisions for protection that concern their land	•	•	•	•	
3. Reducing leakage of benefits	Economic activities mainly reside in local people such as local restaurants and cafes, local transportation, local museums, etc.	•	•	•	•	Contradictory points where SwAM and CAB Skåne mention that fisheries have high political influence (I-1, I-2, I-4 & I-5), whereas fisheries in Skåne mention that tourism has more benefits for profitable activities (I-11)
4. Profitable and sustainable activities	Seasonal entrance to areas, speed limits, restriction of activities in certain areas and depths included in management and conservation plans. Spatial planning for fishing control and maritime shipping (I-9)	•	•	•	•	Issues with fisheries and leisure activities. Some activities forced to stop due to strict regulations (I-7 & I-11)
5. Promoting green marketing	Ecotourism locations (e.g. Naturum in K-S and FM). Specific hostels and transportation in HV. Better routes for Golf Club in L.	•	•	•	•	
6. Promoting diversified and supplementary livelihoods	Promotion of restaurants, kiosk, tourist destinations, accommodation, hiking trails, etc.	•	•	•	•	
7. Providing compensation	Not applicable for water-based activities for HELCOM designation (I-4 & I-5). Only applicable for properties, forests, and pastures areas.					

8. Investing MPA income in facilities for local communities	Not enough evidence found for application					
9. Provision of state funding	Funding from EU and national level to subnational, regional, and local levels	•	•	•	•	Contradictory opinions from national to regional levels as CAB Skåne mentions lack of enough funding for management and monitoring (I-4-6)
10. Provision of NGO, private sector and user fee funding	Väderöfonden for environmental, cultural care and maintenance in HV (Väderöfonden, 2020) EUROPARC Certification in K-S (Kullabergsnatur, 2020)	•	•			
11. Raising awareness	Information in official websites, management plans, museums, maps.	•	•	•	•	Reinforcement is lacking mostly for local levels
12. Promoting recognition of benefits	Through management plans and official websites	•	•	•	•	Reinforcement is lacking mostly for local levels such as the municipalities (I-3)
13. Promoting recognition of regulations and restrictions	SEPA's official website, management plans, proposals and decisions, maps and signalisations.	•	•	•	•	
14. Promoting collective learning	Validity of scientific knowledge for development of inventories and NGO experts.	•	•	•	•	Local views claimed to not always be considered in the decisions taken
15. Agreeing approaches for addressing uncertainty	Monitoring activities for ecological status of habitats and species	•	•	•	•	Lack of guidelines for municipalities and CAB Skåne (I-3 & 5) and uncertainty for fisheries (I-11).
16. Independent advice and arbitration	Scientific data and monitoring from Universities and other Institutes. (Figure 15)	•	•	•	•	
17. Hierarchical obligations	Obligations at different levels with opportunity for local intervention.	•	•	•	•	Issues with obligations in interlinked areas and conflicts within local levels.
19. Penalties for deterrence	Included in the Swedish Penal Code and the SEC (Ch. 29 & 30)	•	•	•	•	
20. Protection from incoming users	According to SwAM, it does not apply in these areas (I-1 & I-2).					Conflicts with building jetties and summer houses (I-1 & I-2). Summer houses are an issue for not paying taxes in FM (I-10).

21. Conditions to use and property rights	Included in the management plans under the SEC (Ch. 7 Sect. 6 & 25). The landowners are the responsible for the maintenance and the administration of the owned areas.	•	•	•	•	Economic issues for maintenance of areas within the MPAs
22. Cross-jurisdictional coordination	Coordination between SEPA and SwAM for interlinked areas Collaboration across sectors such as shipping and fishing	•	•	•	•	Issues and confusion for addressing conflicts in interlinked areas (I-4 & I-5) Conflicts among sectors (I-9)
23. Clear and consistent legal definitions	Consistency defining objectives of MPAs, showing restrictions and jurisdictional boundaries.	•	•	•	•	Problem of interpretations according to I-10 Issues understanding roles of Municipalities (I-7)
24. Clarity concerning jurisdictional limitations	Jurisdictional limitation for land- and water-based areas between SEPA and SwAM.	•	•	•	•	Conflicts with interlinked areas and issues with protection of birds (in SEPA) related to fishing (in SwAM) (I-4 & I-5)
25. Legal adjudication platforms	Environmental Court and appealing guidelines	•	•	•	•	
26. Transparency, accountability and fairness	All regulations, decisions, proposals and management plans have free online access in SEPA's website and other websites of actors involved	•	•	•	•	Lack of update of HELCOM information (Interview 4-5) Lack of transparency from actions in Municipalities and CAB Skåne for restrictions and exceptions (I-10 & I-11)
27. Rules for participation	Included in the SEC, management plans of the areas and official websites. More information available in Section 5.1	•	•	•	•	Many local actors such as municipalities and NGOs not involved in practice for management of the areas (I-3 & I-7)
28. Establishing collaborative platforms	Regular meetings among national, subnational and regional level. Workshops between CAB Skåne and SwAM (I-1 & I-2)	•	•	•	•	Not well-established collaboration platforms from regional to local levels (I-4 & I-5)
29. Neutral facilitation	Not enough evidence found of application					
30. Independent arbitration panels	Consultative Group for Nature Conservation and "Forums for the Reserves" for cooperation among actors (CAB Skåne, 2020a). However, not enough evidence found of its					

	empirical application in the areas.					
31. Decentralizing responsibilities	Decentralization of responsibilities mainly to subnational and regional levels with certain control from the state (Section 5.1 & 5.2)	•	•	•	•	
32. Peer enforcement	Mainly between national, sub-national and regional levels.	•	•	•	•	Collaboration of actors across levels needs reinforcement (I-3, I-4, I-5, I-8, I-10)
33. Trust and capacity for cooperation	Mainly between national, sub-national and regional levels.	•	•	•	•	Lacking among local levels (I-3, I-10 & I-11)
34. Linkages between relevant authorities and user representatives	Mainly between national, sub-national and regional levels	•	•	•	•	Meeting with municipalities are seldom or only when the area is proposed as an MPA. (I-3 & I-7).
35. Building on local customs	Not enough evidence found of application					
36. Potential to influence higher institutional levels	Through comments and appeals	•	•	•	•	Perceptions in the local level refer to a lack of inclusion for decisions taken (I-3, I-7, I-10 & I-11)

### 10.5 Appendix E: Visual explanation of balancing and reinforcing loops within the CLD.

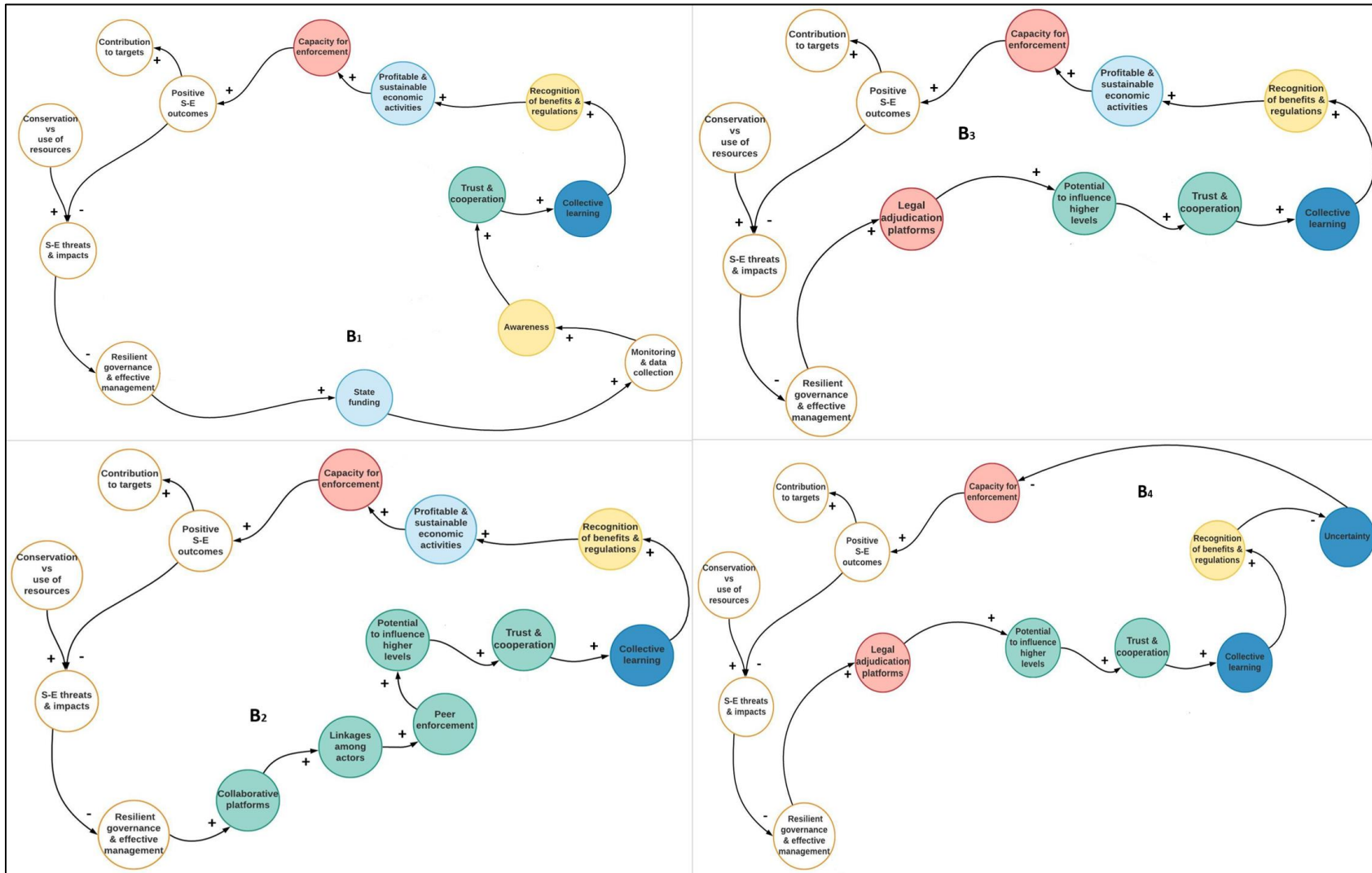


Figure 25. Visual explanation of the balancing loops (B1 – B4) within the CLD in Figure 20. Author’s image. Diagrams developed in Lucidchart.

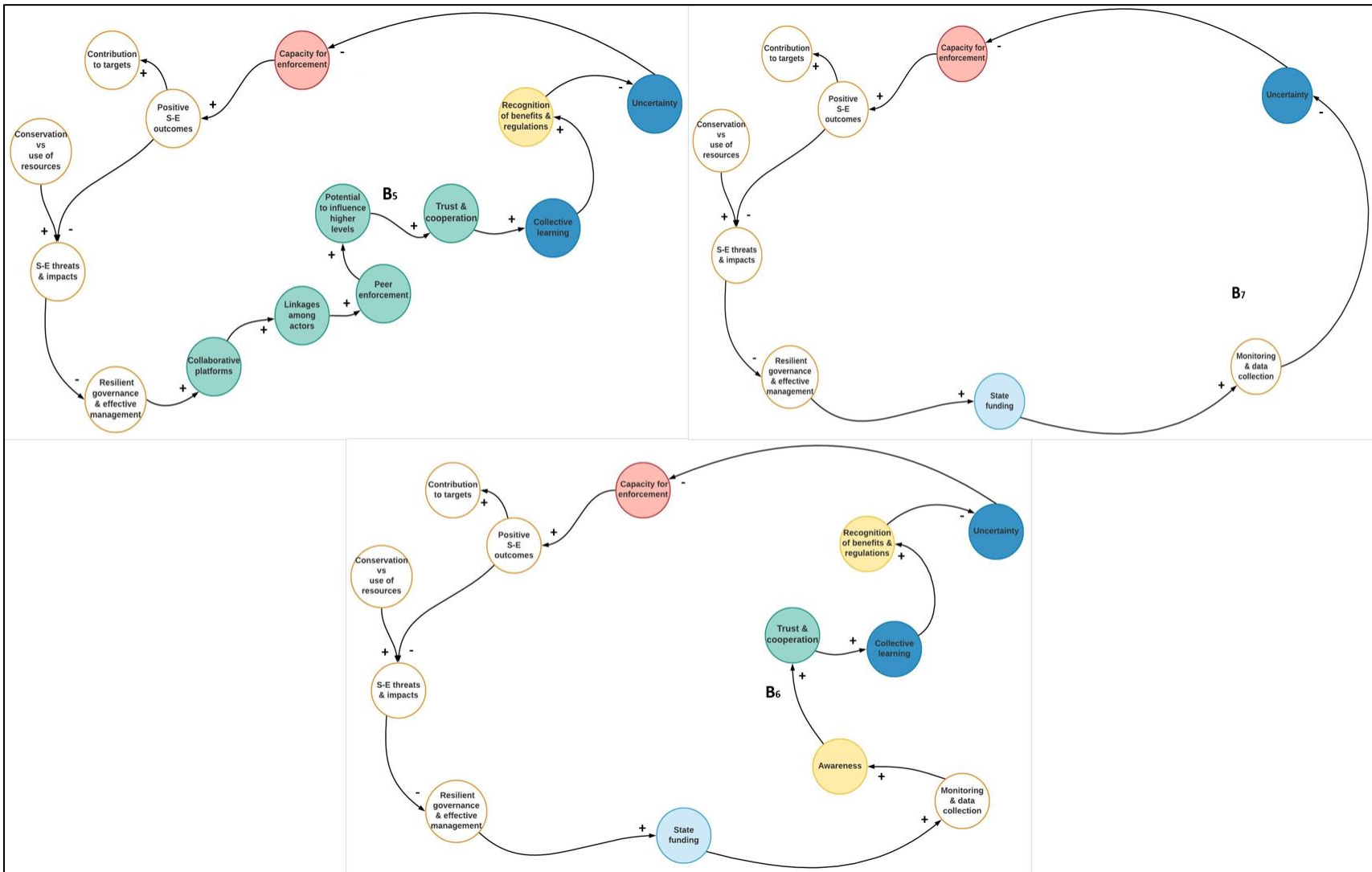
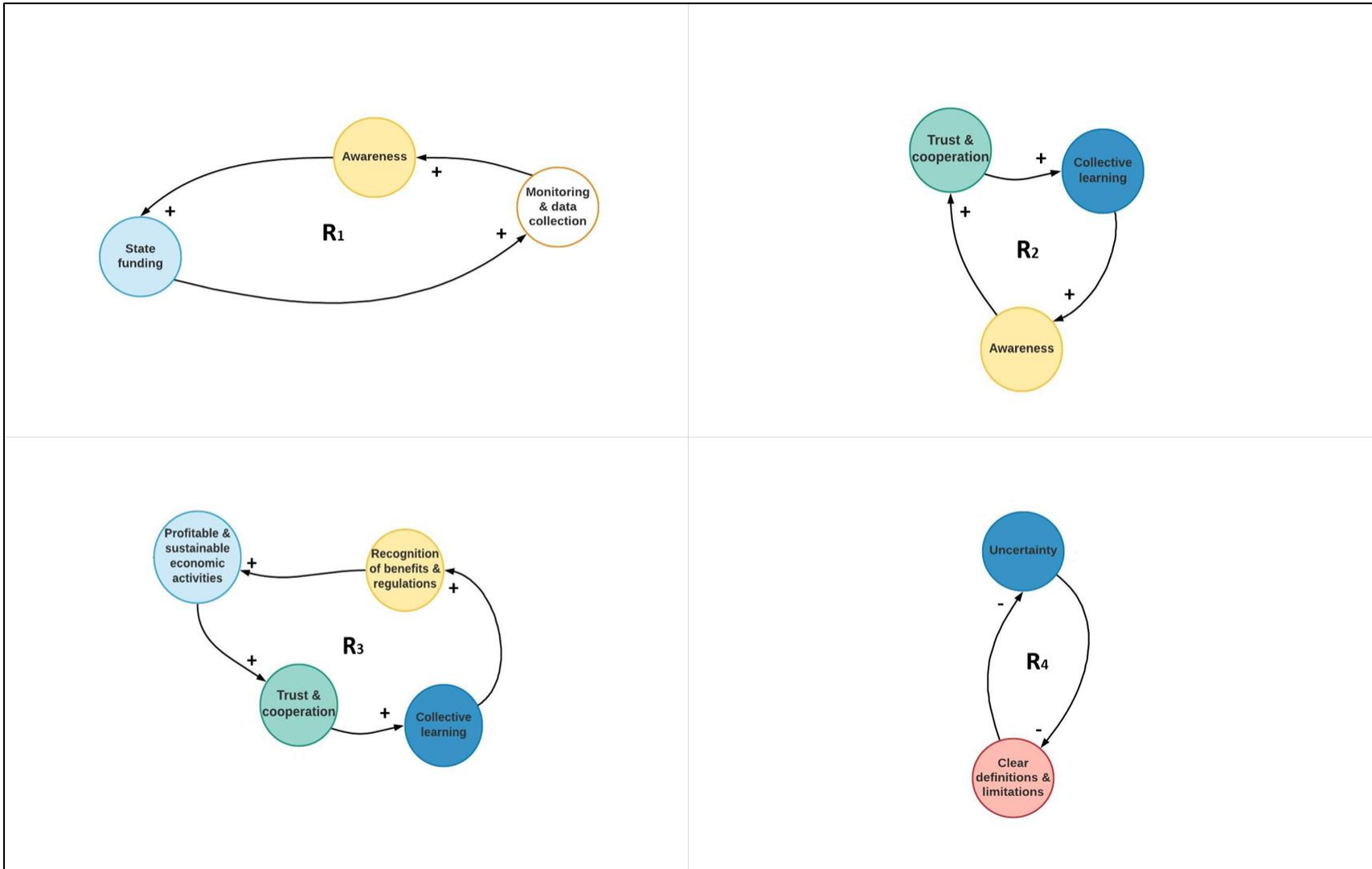


Figure 26. Visual explanation of the balancing loops (B5-B7) within the CLD in Figure 20. Author's image. Diagrams developed in Lucidchart.



**Figure 27.** Visual explanation of the reinforcing loops (R1-R4) within the CLD in Figure 20. Author's image. Diagrams developed in Lucidchart.