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Thicker than water

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Exploring values among actors sharing a water body for effective management: The case of Lake Ringsjön

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Abstract

The underlying values people hold in relation to the environment is an important aspect to consider when natural areas are shared. These underlying values, so called value orientations, and differences in values directed towards a natural phenomenon can impact views on suitable management, lead to disagreements and even conflict. An understanding of the diverse aspects of nature people value can therefore be important for finding appropriate management options. Water is one of our most important elements, but due to its particular characteristics and the importance, it is also one of the most difficult to manage and conflicts commonly occur in relation to water. This thesis aims at exploring values different actors, sharing a water body, describe and have in relation to water. This to, in extension, investigate the implications the values can have for future management, for avoiding conflict and for increasing the ability to cooperate. In order to explore values I developed a framework including a range of 'environmental values'. By using Lake Ringsjön, in Scania County, Sweden as a case, I conducted semi-structured interviews with actors who are related to some activity in the area. The findings show a variety of values in relation to water and both differences and similarities in the actors value orientation. Additionally, different ways of describing the term 'value' was seen among the actors. While caring for a healthy water was commonly expressed, the underlying reasons varied, which can be related to the individual's values. Further, the actors showed different views on each other's practices and several respondents viewed their organisation as misunderstood. These factors indicate that communication among the actors can be improved and values can assist to facilitate such communication. Insights on values does not solve conflict or lead to more effective management *per se*, but it can serve as a basis for understanding difficulties in reaching agreements and pinpoint areas where there might be resistance, in order to find solutions that are seen as legitimate by all parties involved. Bringing in 'environmental values' into practical water management on a local level can give insights to the character of human-environmental interactions and contribute to a sustainable water management for humans as well as for non-human species.

Keywords: Actor, Environmental management, Environmental values, Shared water bodies, Value orientation

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1. Introduction

Devising ways to sustain the earth's ability to support diverse life, including a reasonable quality of life for humans, involves making tough decisions under uncertainty, complexity, and substantial biophysical constraints as well as conflicting human values and interests (Dietz, Ostrom & Stern, 2003, p.1907).

The values people have in relation the environment and direct towards nature is an important aspect to acknowledge when natural areas are shared. The underlying values impact our attitude towards the environment (Schultz & Zelezny, 1999; Stern & Dietz, 1994) and can, along with differences in specific values directed towards a natural area, impact views on suitable management, which in turn can lead to disagreements and even conflicts. There is, in other words, a relationship between values, management and conflict. A shared understanding of what is meant by 'value' might differ and lack of shared understanding regarding the meaning of value can hinder effective environmental management (Reser & Bentrupperbäumer, 2005). Opinion differences on the most appropriate option among management alternatives can be due to different stakeholders having different underlying values associated with the phenomenon in question (Layden, Manfredo & Tucker, 2003). Insights on values can further contribute to developing new ways to manage natural areas (Lockwood, 1999) and has been suggested to be a key component for improved natural resource management (MacDonald et al., 2013). Differences in values have been identified between various groups of society and all these are important to acknowledge in management to avoid conflict (Stein, Anderson & Kelly, 1999). Value differences in an environmental context have been researched in relation to gender (Dietz, Kalof & Stern, 2002), ethnicity (Kalof, Dietz, Guagnano, & Stern, 2002) and different types of community or stakeholder groupings (e.g. Jackson, Stoeckl, Straton & Stanley, 2008; MacDonald et al., 2013; Seymour,Curtis, Pannell, Roberts & Allan, 2011).

Water can be characterised as the 'bloodstream of the biosphere' (Falkenberg & Rockström, 2004) and as a 'circulating resource' (Okie & Kanae, 2006) unrestricted by regional and national boundaries, which makes it different from other natural resources. The importance, variety of interests associated with water, along with variation in space and time can complicate management of water bodies (Wolf, Kramer, Carius & Dabelko, 2005). Such a vital element as water is bound to come with competing interests and even conflict. Water management has been argued to, by definition, be conflict management, but sharing water can also lead to cooperation (Wolf et al., 2005). Differences in underlying values towards a resource may give rise to different opinions about suitable management

and can create management conflicts (Cocklin, 1988). Therefore understanding values associated with natural resources can be useful in conflict resolution (Seymour, Curtis, Pannell, Roberts & Allan, 2008) and possibly conflict prevention. Information about different values might, for example, be used to anticipate level of agreement among different groups (Layden et al., 2003). In other words, understanding values can be helpful for communication, finding suitable management options as well as assisting in conflict resolution and conflict prevention.

Values in relation to water is a limited topic of research in a Swedish context, with the exception of values in economic terms (Svenskt Vatten, 2014) and water as a part of multiple benefits from ecosystem services (e.g. Björklund, Limburg & Rydberg, 1999; Bolund & Hunhammar, 1999). Seeing the need for a deeper understanding of "values of water" in order to manage the challenges of water in a changing climate, the research consortium Sweden Water research initiated a project called 'Vårt självklara vatten", meaning our given or 'taken for granted' water. This thesis is a contribution to that larger project.

Balancing the need and variety of uses for humans and at the same time guarantee enough water to sustain ecosystems is a difficult task, even in a country with plenty of water. Gleick (1998) asks the question "How are all these values, which sometimes conflict, to be prioritized?" (p.573). The author further suggests seven sustainability criteria for water planning, of which one is defined as "Institutional mechanisms will be set up to prevent and resolve conflicts over water" (p. 574). Further, participatory measures are suggested to do so. In accordance with the Water Directive from the European Union, Sweden has established so called water councils to increase participation in management (Franzen, Hammer & Balfors, 2015). Such a water council is located in Lake Ringsjön in Scania County, in the south of Sweden. The area offers a diversity of interests and has been determined as having 'high nature values' and as 'nationally particularly valuable water' (Ekologgruppen n.d. a&b). The lake is further a reserve reservoir for drinking water, but not a water protection area at this point (Länstyrelsen Skåne, 2013). However, the Sweden Water & Wastewater association argue for an increased protection of Swedish drinking water reserves (Svenskt Vatten, 2013), something that might impact Lake Ringsjön and many other Swedish waters in the future.

1.1 Contribution to Sustainability Science

Research within Sustainability Science strives to combine problem-solving with critical approaches (Jernek et al., 2011) of which this thesis has aspects of both. The problem-solving part lies in that the subject has a clear grounding in the needs of the society. It also offers a critical and problematizing approach to value concepts, which are often used but rarely problematized in practical environmental

management. Further, Sustainability Science "seeks to understand the fundamental character of interactions between nature and society" (Kates et al., 2001, p.641). The various ways in which humans value nature is one way of exploring such an interaction. Water planning and management have traditionally focused on meeting human demands. For a future of sustainable water management, which incorporates both needs for humans and needs for the biosphere (Gleick, 1998), investigating environmental values related to water can serve as one step in this direction. It can also contribute to the question of how we more effectively can manage human-environmental systems towards a sustainable future (Kates et al., 2001).

1.2 Aim and research questions

The aim of this study is to explore values in relation to water among actors sharing a water body. In extension to inform future management, avoid conflicts and increase the ability for cooperation. This may be increasingly important if Lake Ringsjön is to become a 'water protection area' in the future. In order to fulfil this overall aim, I have three research questions.

> RQ 1: How do the actors perceive their own position and the other actors' position within the shared water body?
>
> RQ 2: What similarities and differences are there in how the actors perceive the status and reason for the status in the shared water body?
>
> RQ 3: What kind of value statements appear in the actors' discussions about water in general and the lake?

In order to answer these questions and my overall aim with the study, I will first describe a 'value framework', which was developed based on previous studies in the field. Following this, I will present the research design of a case study and details on my case, Lake Ringsjön. I then describe the method semi-structured interviews and my analytical approach for examining the interviews. In this section I will also elaborate on research limitations and reflect on the research process. The findings from my analysis will then be presented in the order of the three research questions followed by a discussion on the implications of my findings for future management, potential barriers and ways forward. Last, I conclude with future potential research objectives within the project "Vårt självklara vatten".

2. A value framework

In this section I will first discuss the term resource and elaborate on differences between an actor and a stakeholder. Following this I operationalise the term 'environmental values' since the use of it might differ. Last, I will describe previous studies where values have been examined and conceptualise those values into a 'value framework'.

The word 'resource' can have connotations to usefulness to humans. An aspect of the natural environment has further been suggested to not have a resource value if humans do not demand it and have the possibility to extract it (Rees, 1985). Viewing the natural environment solely as a resource might therefore exclude some value statements and steer the focus to values in relation to direct use for humans. Further, a water body might not be seen as a resource if it acts as a recipient. However, this does not have to be the case, an element can be viewed as a resource for aesthetic values or for its inherent ecological value as well, depending on the individual (Cocklin, 1988). Yet, one needs to be aware of the undertones the word 'resource' might have when exploring values. I further use the term actor instead of stakeholder in this context. This to illustrate the relation to some activity in the lake, to indicate that the respondents are actively interacting in relation to the lake via their organisations and that they interact with each other. An actor is always a stakeholder, but a stakeholder does not have to be an actor. For example, I see the aquatic ecosystem as a stakeholder in this context, but not an actor.

2.1 'Environmental values'

The expression 'environmental values' can have different meanings. Environmental problems and management often requires an interdisciplinary approach, but values in relation to nature are seen differently among disciplines. Natural and physical sciences, for example, tend to focus on values as processes or species. It is also often discussed in more socio-economic terms with reference to ecosystem services or market value (Reser & Bentrupperbäumer, 2005). On the other hand, social science oriented disciplines often use values as a psychological and/or social construct (Reser & Bentrupperbäumer, 2005). Even in research within the topic of values in an environmental context, differences appear. For example, Seymour et al. (2011) use 'environmental values' as one value type, indicating for example values of fish- and bird habitat and differentiate it from social and economic values of the resource. This is similar to how Jackson et al. (2008) use it, where 'environmental values' are seen as one of many values in an environmental context. On the other hand, Reser and Bentrupperbäumer (2005) propose a definition of 'environmental values' as referring to "individual and shared community or societal beliefs about the significance, importance, and well being of the

natural environment and how the natural world should be viewed and treated by humans" (p. 141). Satterfield (2001) offers a slightly different definition of 'environmental values' as "the direct and indirect qualities of natural systems that are important to the evaluator, including ethical expressions of value" (p.332). Both these definitions indicate that value is something humans do. Satterfield (2001) argue that since only humans are moral agents, humans are the only ones who have the ability to evaluate. However, non-human organisms can still have value within themselves. Reser and Bentrupperbäumer (2005) argue that 'environmental values' are found within humans, societies and institutions. In Sweden, 'nature value' is often used and usually refers to nature or some aspects of nature to 'have high value', such as that Ringsjön is an area *with* high nature values.

I will from hereafter refer to 'environmental values' as qualities in the natural world, based on the definition by Satterfield (2001). This since it can allow more room for a wide range of values when all qualities that are important to the person who value are incorporated. I also see value as something humans direct or have towards and in relation to nature, but that does not mean that humans cannot value nature for intrinsic reasons.

2.2 Previous studies - Relations between values, management and conflict

2.2.1 Management and values

Management is connected to values in several ways. First, as mentioned before, the understanding of what constitutes a 'value' might differ. Different understandings of 'values' in an environmental context is not only visible in academia but in other parts of society as well. This was exemplified by the work Bentrupperbäumer, Day and Reser (2006) specifically on the meaning of 'World Heritage Values'. The authors' found that the meaning differed largely both between visitors and management staff, but also within the individual management agency. This lack of common understanding about the meaning of value might, among other things, hinder effective management (Bentrupperbäumer et al., 2006; Reser & Bentrupperbäumer, 2005). Second, opinion differences on the most appropriate management alternative can be due to different stakeholders having different values, something that may hinder effective management (Layden et al., 2003). Third, differences in values have been identified between various groups of society and all these may be of importance to consider in management. Individuals are, for example, likely to value aspects of the landscape differently if from a rural or urban setting or dependent on their profession. Stein et al. (1999) saw that rural stakeholders valued specific features of the landscape more (e.g. rivers), while urban stakeholders placed more value on the whole ecosystem. Seymour et al. (2011) studied three 'community types' (urban and rural residents, rural landholders and natural resource managers, and environmental group members) concerning three

different value categories. In general, urban residents, rural residents and rural landholders showed more similar responses than natural resource management professionals and environmental group members. The latter two emphasised values relating to, for example, habitat for species more, while economic values were seen as less important. However, the results also showed that all groups had some values in common. Stein et al. (1999) further showed that stakeholders tended to focus on large, broad values that are difficult to measure in economic terms and also favoured cooperative management practices over managing for a particular problem. However, values that are difficult to measure in economic terms might be neglected in water planning and management (Greiner & Hall, 2006). Further, management options are usually scientifically based, but if they do not also take the values of the community into account, this can lead to conflicts about the management decisions (Stein et al., 1999). In other words, there can sometimes be a mismatch between the values of stakeholders and the management practice, something that might lead to conflict.

2.2.2 Management, values and conflict

Conflict can be due to several reasons and can have explanations on different levels. According to Cocklin (1988) a common view is that water conflicts are due to the scarcity of the resource relative to the diversity of demands. Wolf et al., (2005) argue that water conflicts can be seen through one or more of three factors; quantity, quality and timing. First, quantity refers to competing interests of wanting to get as much out of the resource as possible. Conflicts around quantity can also be in terms of floods. Second, regarding quality, conflict can arise when the ones affecting the quality and the ones affected by the quality interact. Quality and quantity are further linked, as low quantity concentrate pollutants and can decrease the quality. Large quantities, for example in a flood, can also contaminate the water and reduce quality. Third, timing of flow can be a critical issue, especially for rivers, where upstream activities may influence the flow patterns downstream. Timing can be important for lakes as well, for example when water is withdrawn from the lake, thereby changing the natural lake level patterns. Both Cocklin (1988) and Wolf et al. (2005) agree that conflicts over water usually have reasons rooted more deeply. These reasons can be found in management, which, in turn, is affected by values (Cocklin, 1988).

One distinction in terms of uses are those between consumptive- and non-consumptive uses. Bohnet and Kinjun (2009) found that conflict can occur between the consumptive uses, which are usually easier to quantify in economic terms (such as water withdrawal for irrigation or drinking water purposes) and non-consumptive uses (e.g. recreational use) or intrinsic values. It can also lead to problems with resource allocation, where water is preferentially allocated to activities with economic

benefits (Jackson et al., 2008). While some values are complementary, such as values of a healthy ecosystems and some recreational values, others are competing. These competing values can, for example, be irrigation and water quality for aquatic organisms or water withdrawal from the rural landscape to meet demand from the urban population (Jackson et al., 2008). Even if the goal is perceived as the same, disputes can still arise. Pendergraft (1998) exemplified this as "everybody wants a healthy biosphere but how healthy it needs to be and at what cost to whom are at the heart of controversy" (p. 644).

2.3 Categorisations of 'values'

Environmental values can be categorised in various ways. A schematic overview of the different types of values found in the literature on the topic of values in an environmental context can be seen in figure 1. The different values will then be described in detail below, followed by an operationalisation of how the values will be used throughout this thesis.

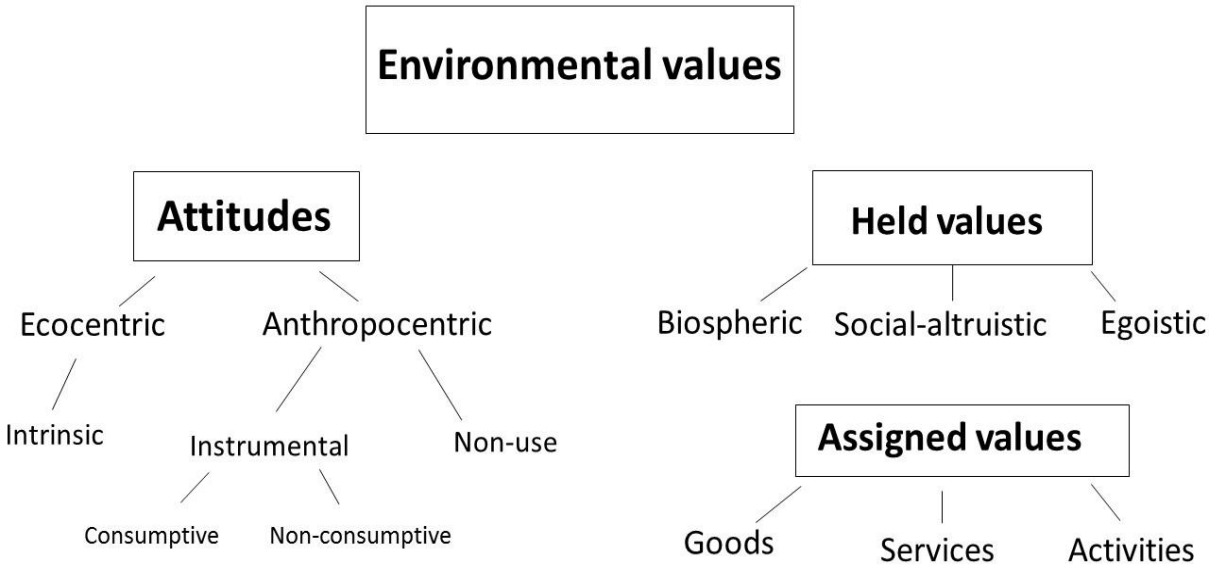

Figure 1: A schematic overview of different types of environmental values. Showing held values, and the three types of held values (Stern & Dietz, 1994) assigned values and the three categories (Lockwood, 1999), ecocentric or anthropocentric attitudes (Thompson & Barton, 1994) and interpreted values associated with the categories, namely, intrinsic and instrumental, respectively. Also showing consumptive and non-consumptive values which are interpreted as instrumental values and non-use values which are seen as anthropocentric.

2.3.1 Theoretical basis - The Value-norm-belief theory

The value-belief-norm theory (VBN) is a framework used in order to explain motivation for pro-environmental behaviour (Stern, 2000; Stern, Dietz, Abel, Guagnano & Kalof, 1999; Stern, Dietz & Kalof, 1993). The value aspect of the framework consists of three value orientations, namely egoistic, social-altruistic and biospheric (Stern et al., 1993). Beliefs relate to the feeling of being able to relieve the pressure on the environment and restore the things the individual values (i.e. self, others or the biosphere) (Stern et al., 1999). Personal norms refer to the moral obligation for individuals to preserve the environment (Stern, 2000). In this context, the value part of the theory is of most interest. Based on egoistic values people will support protection of the environment if it benefits them personally. With a basis in social-altruistic values, the individual weigh the cost and benefits for other humans, which can range from the immediate community to humanity at large. Individuals with a biospheric value orientation focus on the costs or benefits for ecosystems or the whole biosphere (Stern & Dietz, 1994). A distinct biospheric value orientation can be difficult to identify empirically (Stein & Dietz, 1994). However, later, quantitative empirical indications for three distinct orientations have been found (de Groot & Steg, 2008; Schultz, 2001).

A similar distinction as the value orientations is made my Thompson and Barton (1994). Instead of using the term value, they differentiate between two 'attitudes' towards the environment. The attitude can either be 'ecocentric' or 'anthropocentric' with the distinction whether people value nature for its own sake (i.e. because of its intrinsic value) or because it benefits humans. Further, although both types can articulate environmental concern, the reasons for the concern differs, which can lead to different aspects of preservation to be seen as important (Thompson & Barton, 1994). The authors' further state that their 'ecocentric' attitude is similar to the biospheric value orientation, while an anthropocentric motive is comparable to egoistic and social-altruistic value orientations.

2.3.2 Held- and assigned value

A value orientation is an individual's combination of held values (Stern, 2000). Held values have been described as "principles or ideas that are important to people, such as notions of liberty, justice or responsibility" (Lockwood, 1999, p.382). These are separated from 'assigned values', which are more specific and often related to a phenomenon or a specific natural place (Seymour, Curtis, Pannell, Allan and Roberts, 2010). This object can further have a value as a whole or have value for a particular purpose (Brown, 1984). Assigned values can also be divided into three categories: services, such as education, goods (e.g. timber) or activities, for example recreation. (Lockwood, 1999). Held values have been argued to be, at least partly, determinants of assigned values and are seen as more stable

(Brown, 1984; Lockwood, 1999). However, Seymour et al. (2010) have shown that the same held value was coupled with different assigned values and therefore held values might not have to be a predictor for assigned value. In summary, held values are more general views towards the environment, while assigned values are more specific values attached to a certain natural place or phenomenon (Seymour et al., 2010).

2.3.3 Intrinsic and instrumental values

A useful distinction is that between intrinsic- and instrumental value. Intrinsic values are, as mentioned above, related to ecocentric attitudes while instrumental values are anthropocentric (MacDonald et al., 2013). Lockwood (1999) describe intrinsic value as to "indicate that the referent entity is an end in itself, such that the value is autonomous and independent of any other entity" (p.382) and instrumental values "indicates that the referent entity is a means to achieving a purpose of another entity" (p.382). The main difference between the two lie in if something is valued independent of the function or use for humans or if the value lies in how the attribute is used. Instrumental values can further be divided into non-consumptive and consumptive uses (Bohnet & Kinjun, 2009), thereby differentiating between the more direct services in terms of goods and for example recreational and aesthetic values. Anthropocentrically based values is not limited to instrumental values, this depends on what is considered anthropocentric and what is considered 'use' (Jax et al., 2013). Valuing the existence of nature or some aspect of nature (Krutilla, 1967), for example, may be anthropocentric but not related to use. These types of values are sometimes referred to as 'non-use' values (Chan, Satterfield & Goldstein, 2012). The ecosystem services concept is widely used relation to natural resource management (Jax et al., 2013), has been criticized just for the anthropocentric focus (see Schröter et al., 2014 for a detailed description of critique and counter-arguments). It has been argued that ecosystems have an intrinsic value and that the ecosystem services concept reduces nature to solely providing services for humans (MacCauley, 2006; Norgaard, 2010).

2.4 Operationalising values

Considering the aim of this study, to explore the values of different actors with diverse activities in a shared water body and in extension, the implications this has for management, avoiding conflicts and ability to cooperate, I will address both held values and specific values in relation to water. For held values, I use the value orientations from the VBN-model (i.e. egoistic, social-altruistic and biospheric). Statements on the benefits of water or aspects of water for own livelihood or own family is considered egoistic. Statements focusing on everything from benefits for the community to concern about future generations of humanity at large is considered social-altruistic and mainly focusing on the benefits for

non-human organisms and/or physical habitat is considered biospheric. In terms of specific values, I will focus on consumptive- and non-consumptive use values, non-use values and intrinsic values. Consumptive uses are resources extracted from water or consumption of water directly. Non-consumptive uses are, for example, recreation, swimming and aesthetic values. Values of which are anthropocentrically based but not used in any sense, such as existence value, is referred to as 'non-use'- values. Intrinsic values are difficult to distinguish and define. Perhaps these values should be defined through what it is not. It is not valuing nature because of its provisioning capacities for humans, not for functions that in extension leads to benefits for humans and not even that it gives a person the satisfaction of knowing that it exists. Noteworthy is also that there is some overlap between assigned values, and consumptive and non-consumptive use values, for example a good is consumptive and activities can be consumptive or non-consumptive. The framework is meant to be broad and incorporate many different ways of valuing water. As noted by Norgaard (2010) the concept of ecosystem services carries the risk simplifying nature to stocks and flows. Therefore the ecosystem services concept, although widely used in environmental management, is considered too narrow for this exploratory investigation of values.

3. Methodology

In this section the ontological and epistemological view underlying the research will first be discussed, followed by a motivation for the research design of a case study. I then describe the case Lake Ringsjön, the semi-structured interviews and how the analysis was carried out. I end this section by reflecting on the process including limitations, reflexivity and ethical considerations.

3.1 Ontological and epistemological standpoint

In this study I am interested in the actors' perceptions of a shared water body and the values they describe and associate with water. This requires an ontological perspective which allows for subjective realities, which is why I adopted a constructivist ontological standpoint. This is combined with an interpretivist epistemology. I am interested in the actors' views and experiences leading up to value statements regarding the phenomenon in question so an epistemology that allows this is needed (Bryman, 2012). With this positioning, it is further important to note that I am, as a researcher, actively involved in constructing the findings. Willig (2013) describes the researcher as a builder who constructs a house. The bricks (i.e. empirical material) can build a range of different buildings. With this in mind, the research process is more like constructing a particular house, than a hunt for evidence about the 'reality' of the world (Willig, 2013).

3.2 Research design

In order to investigate the different values among the actors sharing a water body, I conducted a case study. Case studies allow the researcher to study something in depth within a specific context rather than doing large generalisations (Cadderton & Torrance, 2011). However, this does not mean that insights from the case cannot be of general interest and relevance (Cadderton & Torrance, 2011). The case study design is commonly used for one of three purposes; exploratory, descriptive or explanatory (Yin, 2014). This study is mainly of exploratory and descriptive character, with the aim to understand how the shared water body is perceived as well as what and how different values are presented among the actors. Further, a single case study design is chosen. According to Yin (2014) there are five rationales[1] for doing a single case study of which Lake Ringsjön will serve as a 'common' case. Lake Ringsjön was considered a suitable case due to the variety of activities in the area and the active water

[1] The five rationales for choosing a single case study are: the case is critical, unusual, common, revelatory or longitudinal (Yin, 2014, p.51- 53).

council. Councils of this type have been established all over Sweden to facilitate management of shared water resources (Franzen et al., 2015).

3.3 Case description

Lake Ringsjön is situated in the middle of Scania County, in the southernmost part of Sweden. It is the second largest lake in Scania (Ekologgruppen, n.d.a&b) and consists of three basins; the largest Eastern basin, the Western basin, and the smallest Sätofta basin (Hansson, Enell & Bergman, 1999). Sätofta and Eastern basin have their outflow, via a neck, to West Ringsjön, which has its outflow into the river Rönne å (Ekologgruppen, n.d.a). The Western basin is located in the municipalities Höör and Eslöv, and the Eastern basin and Sätofta basin are shared by the municipalities Höör and Hörby (Holm & Gilbertsson, 2009). A map of the lake area and location in Sweden can be seen in figure 2.

The entire lake is protected for fishing purposes and has a protected riparian zone. The eastern part of the Eastern basin is a Natura 2000 area and several nature reserves are established around the lake (Ekologgruppen n.d.a&b).

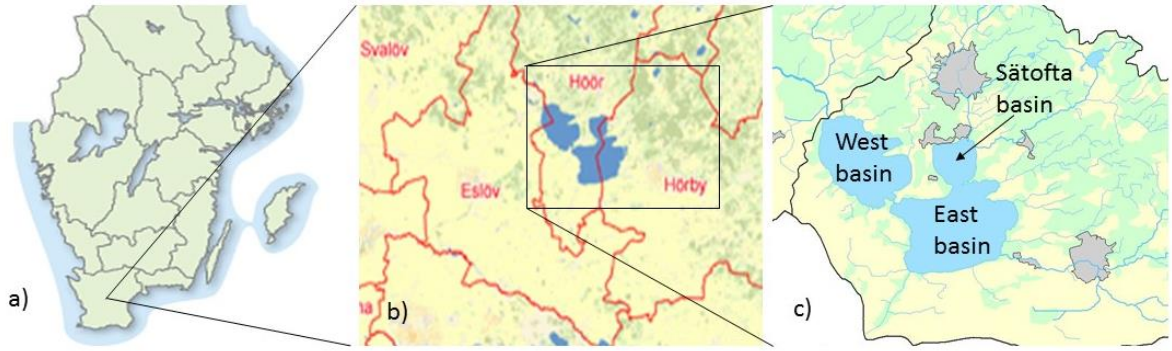

Figure 2: Map over a) southern half of Sweden with Scania in the furthermost southern part (source: modified from Sveriges domstolar, n.d) b) Location of Lake Ringsjön and the municipalities Höör, Hörby and Eslöv surrounding it (source: modified from Val.se, n.d) c) Lake Ringsjön and the three basins Sätofta basin, West basin and East basin (source: modified from map received from Ekologgruppen)

3.3.1 History and problems

In 1883 Lake Ringsjön was lowered by 1.5 meter in order to allow for more agricultural land (Holm & Gilbertsson, 2009). The combination of extensive use of fertilisers and the lowering of the lake initiated an eutrophication process (Hansson et al., 1999). Insufficient sewage treatment was also identified as a contributor to the problems (Holm & Gilbertsson, 2009). The eutrophication led to a decreased

Secchi depth[2] in the 1960s (Holm & Gilbertsson, 2009) and Lake Ringsjön was reported as unfit for swimming at that time (Hansson et al., 1999). During the 1980s widespread algae blooms was a common feature and the fish fauna was mostly dominated by cyprinid fish, such as roach and bream (Holm & Gilbertsson, 2009). In order to re-establish the former trophic levels and reduce the external input of nutrients, several programmes have been performed in the area.

3.3.2 Nutrient reduction- and biomanipulation programmes

In the 1980s attempts to reduce the external input of nutrients were initiated and the programme managed to reduce the external input of phosphorous substantially (Hamrin, 1999). In addition to the nutrient reduction programme, several biomanipulation initiatives have been executed in Lake Ringsjön. The first was performed between the years 1989-1990 with the aim to reduce the amount of cyprinid fish (roach and bream) in Sätofta basin. In 1992 a similar effort was executed in the Western basin. The Eastern basin experienced an extensive fish death in 1988 and no active removal of fish was therefore required (Hamrin, 1999). For a long term success in shifting the balance of a lake, the establishment of macrophytes is an important component (Jeppesen et al., 1997), something that was not clearly seen in Lake Ringsjön (Strand, 1999). Due to non-lasting effects of the biomanipulation, several more fish-reduction programmes have been executed since.

3.3.3 Activities

Lake Ringsjön was used as a drinking water source between the years 1963 and 1987. In 1987 the Bolmen tunnel was taken into operation and water was transported from Lake Bolmen in the neighbouring county to Scania (Davidsson & Krook, 2009). Lake Ringsjön is since then only used as reserve reservoir (Hansson et al., 1999) and, as mentioned before, is not a water protection area. The reasons for establishing a water protection area is to give potential and current drinking water resources a high level of protection in order to secure safe drinking water over generations (Svenskt Vatten, 2013). This type of protection might, however, lead to other activities in the catchment being restricted. In some municipalities, one of the main obstacles for establishing water protection areas is that, “the resistance from inhabitants and/or stakeholders is too large” (Svenskt Vatten, 2013, p.3, author’s translation). In Scania, a conflict recently occurred when a ground water reserve was suggested to gain an increase in protection. This would limit the opportunity for conventional agriculture in the catchment area, something that led farmers to react (Amnell, 2015).

[2] The Secchi-depth is measured with a Secchi disk to examine the transparency of water.

Additional to serving as a drinking water reservoir, commercial fishing has a long tradition and today eel and pike-perch are considered the most important species (Holm & Gilbertsson, 2009). A number of recreational activities are also practiced in the area. This is, for example, recreational fishing, birdwatching, hiking and swimming (Hansson et al., 1999). Additionally, there are camping sites adjacent to the lake. Practices within the catchment centre on agriculture in the southern part and forestry in the northern part of the area (Hansson et al, 1999). Further, Hörby has a sewage treatment plant that release water into Hörbyån upstream of Lake Ringsjön (Ekologruppen, n.d.a &b) and Höör has a sewage treatment plant with an outlet point in the Western Basin (Ekologgruppen, n.d.a).

3.3.4 The water council

The 'Ringsjön committee' was established in 1980 and was in 2007 transformed to 'Ringsjöns water council' (Ringsjöns vattenråd, n.d). 'Water councils' are the attempts at local levels to increase participation, in accordance with the European Union Water Framework Directive (Franzén et al., 2015). One of the main aims of the council is to work as a cooperative body and the council has representation from various actors in the region (Ringsjöns vattenråd, n.d.). The council's statues states that "the water council should contribute to the water management by, in an early stage, be involved in the preparations and discussions on how the water resource should be managed" (Ringsjöns vattenråd, 2013, p.1, author's translation). All actors with an interest in the conservation and use of the lake can apply for membership. However, the three municipalities and the drinking water company have larger control of the projects in Lake Ringsjön, since they are financing projects with additional means than the member fee. When projects are being financed with more than half by these additional means, the four members have the final decision (Ringsjöns vattenråd, 2013).

3.4 Empirical material

3.4.1 Sampling strategy

I used the procedure of purposeful sampling to find participants for the study and an interview profile can be seen in table 1. This is a strategic way of sampling in order to find participants who will be relevant to the research question (Bryman, 2012). Within purposeful sampling there are several sub-categories that can be used together (Bryman, 2012). I used criterion sampling to some extent, as I wanted respondents from a variety of activities in and around the lake. Throughout the process, snowball sampling was also used (Bryman, 2012). This did not, however, entail direct recommendations from the respondents, but within the respondents' answers during an interview, additional potential organisations or particular respondents served as basis for future interviewees.

Table 1: Interview profile for the participants in the study based on the activity they are working in. Also showing whether or not the participant was raised in the region, position in relation to the activity, number of years active in the region (does not have to be in current position) and if they are active in the water council. [a] The informant was part of the water council but stopped participating in the meetings. [b] The Authority is (among other forestry organisations) on the member list, but no forestry organisation is attending the meetings.

Activity	**Raised in the region**	**Position**	**Number of years active in region** (≤5, 5-10, 10-15, 15-20 ≥ 20)	**Active in water council**
Fishing	Yes	Commercial fisherman	≥ 20	Yes
Forestry	No	Employed at Forest administrative Authority	≤5	No[a]
Sewage	No	Employed at municipality	5-10	Yes
Drinking water	No	Employed at Drinking water company	5-10	Yes
Environment	No	Active in Environmental NGO	10-15	No[b]
Environment	No	Employed at municipality	15-20	Yes
Tourism	Yes	Employed at municipality	10-15	No
Agriculture	Yes	Farmer and active in Agricultural organisation	10-15	No

3.4.2 Interviews

I conducted in total 8 semi-structured interviews, lasting between 40 and 90 minutes, in March to April 2015. Semi-structured interviews were seen as suitable for several reasons. As argued by Satterfield (2001), articulating environmental values can be challenging for the respondent and standardised surveys may exclude some of values of abstract character, which is why a qualitative method was seen as appropriate. Respondents might not either be able to answer direct questions about values. Instead questions around aspects that matter to the respondent, why it matters and discussions on trade-offs can give interesting insights (Satterfield, 2001). The flexibility of a semi-structured interview (Bryman, 2012) and still the structure to keep discussions on meaningful topics for my research questions (Lantz, 2013) allowes for such types of questions. I had a set of questions, but did not limit myself to this order during the interview session. I also encouraged the respondent to tell stories and 'think out loud' to aim at establishing a dialogue.

The interview session was divided into three parts (see Appendix A for interview guide). First questions more specific to Lake Ringsjön were discussed, followed by questions about the water council. The last part of the interview consisted of questions on perceptions of water and values. In addition to this part, an exercise where 20 pictures, all showing water in different ways, were laid out. This is sometimes referred to photo-elicitation (Harper, 2002) and can be done in various ways, either by participants selecting pictures provided by the researcher or the participants can bring their own pictures (Bignante, 2010). Although photo-elicitation cannot replace interviews, it can be seen as a complement to provide depth to the discussion or new perspectives (Bignante, 2010). As my topic of interest is of rather abstract character, the pictures were used as means for the respondents to think about a common phenomenon in different ways (Bryman, 2012). The importance was, however, not the pictures themselves, but the discussion following the selection of pictures and to help participants articulate a broader range of environmental values (Satterfield, 2001).

3.4.3 Analytical approach

The empirical material was analysed using qualitative content analysis. According to Hsieh and Shannon (2005) qualitative content analysis can be executed in three ways: conventional, directed and summative. I use the conventional approach for RQ2 and the directed approach for RQ1&3.

The interviews were transcribed in detail from the recordings. The transcripts were then read and re-read several times and interesting aspects in relation to the research questions were highlighted. The highlighted areas were then sorted according to which research question they functioned as giving

insights to. In other words, statements on self, the own organisation and other organisations were sorted into RQ1, statements about perception of the lake was sorted into RQ2 and all value statement was sorted into RQ3.

For RQ1 I used the three categories of conflict from Wolf et al. (2005) as a basis to investigate how the different activities related to each other, based the information from the interviewees. For RQ2 differences and similarities emerged from the material. Regarding RQ3, the value orientation was studied by first examining each respondent's transcript and then comparing the different respondents' transcripts. Additionally, specific value statements was examined through a coding frame (Bryman, 2012) that I developed from value dimensions found in the literature (Brooks, 1976; Brown, 1984; Brown & Reed, 2000; Satterfield 2001[3]) (see table 2). The analysis had both deductive and inductive elements, deductive in the sense that it was based on the coding frame or categories, inductive as new categories emerged if a statement did not fit in any of the codes (Hsieh & Shannon, 2005). Some of the categories were also slightly altered to fit the scope.

Table 2: The value dimensions found in the empirical material and description. The dimensions are either found in the literature, indicated by the reference in brackets or developed from the literature, indicated by the expression 'developed from'.

Value dimension	Description	Note
Ecological	Valuing the importance of ecological system	Developed from the category 'ecological sustainability' in Satterfield (2001)
Rights	The idea that nature has rights and/or the balance between humans' right and natures' rights.	Developed from the category 'rights/equity' in Satterfield (2001).
Recreational (non-consumptive)	Activities in and in relation to water were nothing is taken out from the water	Expanded from the recreational value used in Satterfield (2001)
Recreational (consumptive)	Activities in and/or in relation to water were something is taken out of the water	Expanded from the recreational value used in Satterfield (2001)
Aesthetic	Beauty in life and landscape	(Satterfield, 2001)
Life supporting beyond humans	Water as providing life for all organisms and the biosphere	Divided into life supporting for humans and life supporting

[3] Satterfield (2001) developed the value dimensions inspired by Rolston's book *Conserving natural values* from 1994. I use the dimensions from Satterfield (2001).

Life supporting for humans	Value water as crucial for human life either directly or indirectly, for example by valuing protection of ecology for fish stock.	beyond humans from 'life supporting' (Satterfield, 2001) and 'human life support' (Brooks, 1976)
Future generations	Recognition of the rights for future generations to healthy water	(Satterfield, 2001)
Population	Concern for the equitable division of water among Earth's citizens	Developed from the category 'population sustainability' (Satterfield, 2001)
Economic/good	Valuing water for what it provides in terms of commodities and/or economic opportunities (e.g. tourism)	Developed from Brown and Reed (2000)
Employment	Valuing resource-based jobs	(Satterfield 2001)
Biodiversity	Valuing preservation of biodiversity in terms of variation and/or rarity of species, genes or habitat	Developed from Satterfield (2001)
Pharmacy	Valuing resources in nature that can cure human illness or have the potential to cure human illness	(Satterfield, 2001)
Cultural/traditional	Valuing some cultural or traditional aspect (such as food, in relation to water and/or resources in or around water	Emerged from the empirical material
Therapeutic	Valuing because it makes people feel better, physically and/or mentally	(Brown & Reed, 2000)
Functional	The value of one nonhuman entity to another	(Brown, 1984)

3.5 Research limitations and reflection on research process

When engaging in semi-structured interviews and qualitative research in general, there are a number of aspects to take into consideration. First, reduction of empirical material constructed at the interview point should be minimised (Willig, 2013). Some reduction is inevitable, but to minimise this the

recordings was transcribed in detail. As the interviews were conducted in Swedish, I carefully translated the quotation as to not lose the meanings (original quotations are found in Appendix B). Moreover, based on my agenda, a demarcation is already done by me at the interview session through my follow-up questions (Lantz, 2013). Further, I might have some assumptions and preconceptions about the phenomenon in question, which is why reflexivity is important (Willig, 2013). For each interview I positioned myself as wanting to understand and explore the view of the specific respondent and not to question it. This to not pose judgement or see some values or value orientations as superior to others. However, interpretations of the empirical material is mine and I am essentially trying to make sense of someone trying to make sense of a phenomenon.

Ethical considerations is another important aspect especially with interview methods (Willig, 2013). Before the interview started I had a pre-written text (see Interview guide in Appendix A) that I read out to all participants, covering my topic, some information about me and why this participant was selected, along with the agenda for the interview. Further, I took time to answer questions about the topic before the interview started. The interview venue was chosen by the participant, which were mostly their work place. I asked for consent to record the interviews and ensured that I was the only one listening to the recordings. I also informed the interviewee that direct quotations would be used, but that no names would appear in the text. Due to the sensitivity of some of the topics I do not revel which municipality the informant belongs to nor the exact number of years the participant has been involved in the region. Yet, as the sample was based on activities and organisations, total anonymity cannot be ensured.

Regarding the specific case, one strength with the chosen case also proved to be a limitation. Lake Ringsjön has been researched quite extensively before, which had its benefits in that there was a substantial amount of information accessible concerning the lake. However, this also turned out to be a limitation, when some potential respondents rejected participation due to earlier involvement. This was increasingly complicated since the research design required me to rely on some key respondent and respondents belonging to the same activity can have very different views. I tried address this, for example with the Municipality environmental employee and Environmental NGO respondent, but the unwillingness to participate (e.g. from Forest Company, additional farmers and several tourism practitioners) made this difficult. Noteworthy is therefore that this is a sample of one individual's view, belonging to one organisation within one actor section and should not be seen as the organisation or sectors' entire view. However, the individuals all have an influential role in the area.

4. Analysis

This section is divided according to the research questions. First the perception the actors have on themselves and other actors is presented, followed by perception of the status of the lake and reasons for it. Last in the section the value categories, both in terms of value orientation and more specific values in relation to water, is shown. The quotations are coded with abbreviations and number. Quotations in original language can be found in Appendix B, following appearance in text.

4.1 Perception on positions

Based on the three categories of conflict by Wolf et al. (2005) I categorised the different activities in terms of their influence or if influenced (figure 3). In addition, this section explore the actor's perception of each other and their own organisation to get an overview of their relations.

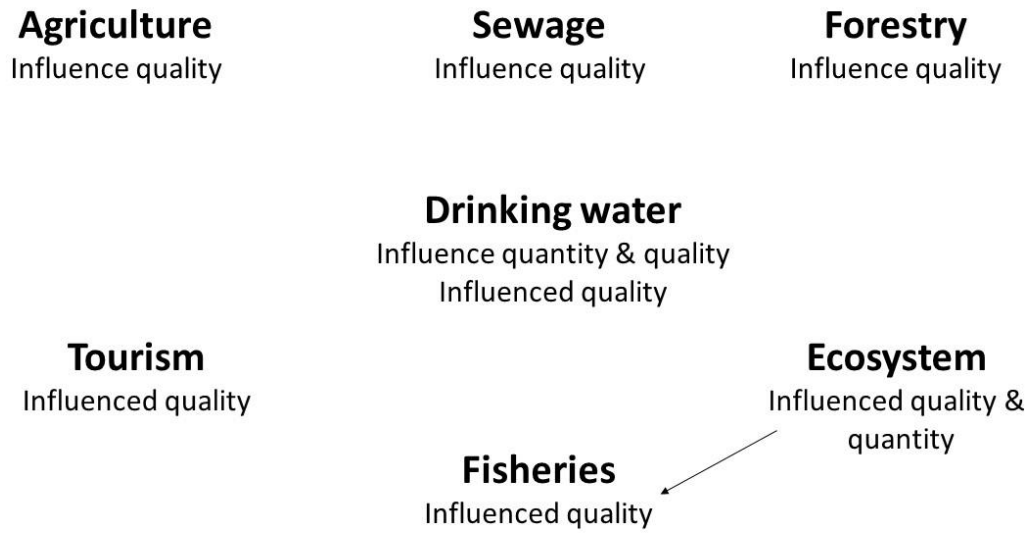

Figure 3: Showing the influences different activities have on water as perceived by the actors and based on the typology (quantity, quality and timing) from Wolf et al. (2005). The arrow from ecosystem to fisheries, indicate that the fisheries is indirectly influenced through the quality influence on ecosystems.

The water withdrawal from the lake for drinking water purposes influences quantity. Additionally there are perceptions that the water withdrawal also influence the quality of the water, which the Drinking water actor (DWP) is aware of.

> "There are people who then think that it is after Sydvatten started to regulate the lake, that is when all these problems appeared so some have, live in that delusion that it is Sydvatten who have made the water in Ringsjön so bad." (DWP1)

One of the respondents had this view. Although timing, as articulated by Wolf et al. (2005), was related to flowing water, the underlying reason in Lake Ringsjön can relate to timing. The Fisheries actor (F) explained it as the natural balance was shifted.

> "And that [the water table lowering in spring] made only maybe 10% of the spawn survive, but that was the right amount, the natural way, that is how it is supposed to be. Then when you regulate the lake, then you hold the lake [the water] until the month of August and then you start to release. You release a little but not at all to the same degree so the lake [water level] does not decrease until the summer and then all who spawn up there in those areas, there will be 100% survival on the spawn" (F1)

The Environmental NGO respondent did not relate it to cyprinid fish, but would have liked to see a more even flow. Now a fluctuation of one meter of the lake level was perceived. Using water for drinking water purposes is further influenced by water quality as the treatment process is more difficult if the lake is polluted.

The sewage influences the quality as they have an outlet point in Lake Ringsjön and another one in a river upstream of the lake. However, the Sewage actor (S) felt as if their practice was somewhat misunderstood.

> "Although many think we are on the other side, since we are a sewage treatment plant. They think we are environmental crooks even though we just treat the water everyone is using, so I actually think we are environmental heroes. If we would not exist everything would just be pouring out" (S1)

This perception might be due to occasional overflow of water in the treatment pools. This was mentioned by two respondents with the claim that this water was untreated. However, the sewage actor argued that even if they have overflow the water never leaves the facilities untreated.

The agricultural practice is influencing the quality, something that the Agricultural actor (A), actively is thinking about in relation to the own farm and the stream running from the property to Lake Ringsjön.

> " I do not use Ringsjön directly but rather, the water from the property runs off into Ringsjön … it is hard to value others use of the lake since I do not use it … well I try to have an edge zone for protection so nutrients do not leak straight into the stream. Keep some distance to the water … if one has seen it as it was before when it bloomed a lot, you think about what you do, to avoid it coming back." (A1)

The respondent distances the own practice from other practices as the respondent do not perceive a 'use' of the lake, but still makes efforts with the lake in mind. This differs from the sewage actor, who viewed their practice as an activity in the lake. This might be due to different perception of 'use' and if 'using as a recipient' also includes agricultural runoff.

Tourism and recreation are affected by the quality and, as noted by the fisheries actor, the perception of good quality might differ.

> "It is very important that it is clear and nice water, and part of it there is the difference, some want clean water for swimming, very high transparency and then someone want it to be good, well that the water is good, but it can be high quality water even if the Secchi-depth is not so good" (F2)

Fisheries is also influenced by the quality via the ecosystem as a toxic lake might affect the fish that is their livelihood. The problem of plastic getting stuck in the nets was forwarded by the Fisheries actor and it was claimed to be from the sewage treatment plant. Further, the actor argued that the fisheries practice influence the ecosystem positively and that the activity is sometimes misunderstood.

> "It can often sound bad for many people when there is a small lake and a fisherman is going to come there, well now he is coming to the lake, now he is coming, now there will be no fish left, but that is wrong … it's few that even know there is commercial fishing in Ringsjön, large commercial fishing, that it gets somewhat hidden in the whole, if you would not have commercial fishing in Ringsjön, you can only imagine all the tons of cyprinid fish we catch, if they were not to be taken out, I can say that, above all, it would have crashed in an instance." (F3)

From this respondents view, the practice is improving the ecosystem, a view that is not shared by the Environmental municipal employee (EME).

> "…we set aside enormous resources to restore, I don't like restore, to adjust the balance in the ecosystem in the lake and then we have the fisheries who work really hard to destroy this balance that we are trying to achieve, because they take up the carnivorous fish and because they take up the large carnivorous fish." (EME1)

The ecosystem can further be influenced by both quality and quantity, in terms of polluted water or changes in the lake level. The respondent from the Environmental NGO portrays a feeling of being alone as the "true friend of nature" among the actors.

> "It is the farmers who do not want to pay and then there are the ones who want to make money on a healthy lake, but so far they have not been interested in paying for it … I am not interested in making money, I have nothing to lose if there will be demands for better treatment, so I do this sort of just because I think it is, I like nature." (ENGO1)

Forestry can also influence quality in terms of nutrient leakage and brownification[4]. Brownification was brought up by the Drinking water actor as this is problematic for purification of water for drinking water purposes. The Forestry Authority respondent recognised that forestry along with agriculture can have an impact. From the respondents view, forestry cannot be executed without environmental impact. However, the respondent have a responsibility to weigh production and environmental aspects equally.

In summary, the lake has multiple influences and several activities are influenced by each other. The complexity increases as the actors have different perceptions of the activities and views on how others perceive their activity. However, almost all respondents believed that the actors in the region all want the same thing, which is a healthy lake. Two respondents, the Environmental NGO actor (ENGO) and the Drinking water actor (DWP), does not completely share this view, when stating "I actually don't think anyone see the value in a healthy lake" (ENGO2) and "but this with a clean water should not be so easy or should not be so hard to agree on" (DWP2).

[4] Brownification refers to the increase of humic content in the water. It affects the taste of the water and increases bacterial growth in drinking water pipe-lines (Bydén & Bydén, 2014). It can also affect predatory-prey interactions (Ranåker, Jönsson, Nilsson & Brönmark, 2012) The humus leaks from forests and the increase in Sweden has been suggested to be due to climate change (with higher temperature and more precipitation), intensified forestry and land-use change. For Scania, the latter is in terms of an increase in coniferous trees (Bydén & Bydén, 2014).

In order to untangle why some believe everyone has the same goal and others not and why it might be difficult to agree, I explored how the actors perceive the status of the lake and the reasons for this status.

4.2 Status and reason for status

4.2.1 Perception of status

Perception of the status of the lake today differed between the actors, where some viewed it as in a very poor state, while other stated that it has never been as good as it is today. Note that the respondents were asked about how they would describe the status today, which is why several saw it as improved. The Forestry Authority respondent is not included in this section or the next, as the respondent did not want to answer these questions.

Two of the respondents viewed the lake as being in a poor state, namely the Drinking water actor and the Environmental NGO, finding it "miserable" and "horrible", respectively. These were also the actors who did not perceive the actors in the region as having a shared goal of a healthy lake. Although the two share similar views on the status of the lake, the way they discussed it differed. The Environmental NGO respondent directed it to own experiences with the partner's sister's dog dying from drinking the water and how the respondent would not swim in the lake. The Drinking water respondent instead argued in technical terms, speaking about the phosphorous content and eutrophication. However, the respondent also commented from personal experience, in terms of how 'green' the lake was. The Sewage actor also experienced the lake as 'green' before, but saw it as better now. This 'improved' view was shared by the fisheries actor, the Agricultural practitioner, and the Tourism responsible. These respondents, except for the Sewage actor, grew up in the region. However, the Sewage actor still refers to it as being improved compared to long time ago when the lake was visited. They all stated that there had been large problems, and two (Fisheries and Agriculture respondents) referred to the measurable Secchi- depth as improved now. Noteworthy is that the Drinking water actor and the Sewage actor both referred to the colour of the lake, but one saw the lake as in a poor state, while the other viewed it as improved. This can be due to the point of reference. Neither the Sewage actor nor the Drinking water actor have been active in the region very long, but the Sewage actor had the point of reference a long time ago, when the respondent visited the lake.

The Environmental municipal employee is positioned somewhere in the middle, naming the status "unsatisfying" and "orange". This respondent also saw the improvement when comparing to before but not as positively as the other respondents who saw an improvement. The respondent also had a

technical perspective similar to the Drinking water actor when naming it orange, based on the scale of ecological status[5] where orange corresponds to unsatisfying.

4.2.2 Perceived reason for status

Four different aspects were seen as reasons for the problem or reasons for improvement in the lake, namely agriculture, sewage, water regulation and biomanipulation.

Two respondents (Drinking water actor and Environmental NGO respondent) saw agriculture as the most important reason for the poor state in the lake. They also both saw sewage as being a contributing factor to the problem. The Sewage actor and Tourism responsible, who viewed the lake as improved both stated better agricultural practices as a contributing factor to the improvement. The Agriculture respondent said it to be less eutrophication, which can indicate both agriculture and sewage. The Environmental NGO actor viewed municipal sewage as the major problem, while the private sewage had limited impact in comparison. The opposite was argued from the Sewage actor who instead claimed that the municipal sewage treatment had not changed, so part of the improved status of the lake was due to better private sewage. The Tourism actor also saw better treatment processes in general as one contributing factor.

The Fisheries respondent stood out when arguing that it is the regulation of the lake for drinking water purposes that is the main reason for the problems in the lake.

> "… but the large problem has been the cyprinid fish, a regulation of the lake was done, a regulation which has depraved the lake, because it takes a couple of years before it is noticeable that the lake has changed" (F4)

The Drinking water provider was (as presented in section 4.1) aware of this view, but rejected the idea. None of the other respondents mentioned the water withdrawal as a reason for the problem, but the biomanipulation strategy was often mentioned.

Several projects have been carried out in Lake Ringsjön, but the biomanipulation is the most central course of action. The Fisheries actor argued for the biomanipulation projects to be the main reason for improvement. All other respondents who stated an improvement mentioned the biomanipulation as a part of this improvement in combination with the above mentioned efforts. The Environmental municipal employee respondent and the Drinking water respondent viewed the biomanipulation as

[5] Ecological status measures the status of surface water on a scale with five steps (bad, unsatisfying, moderate, good and high)

one important part, but only partly contributing to reaching the goal of a healthy lake. The Environmental NGO respondent was the only one who did not see the suitability of the biomanipulation in adjusting the lake balance when stating that “it is like peeing in your pants, you get warm for a short time and then when you stop it gets cold again and even worse” (ENGO3).

Overall there seems to be a common view among the actors of the reasons for the problem. The exception is the Fisheries actor with the water regulation, which was not mentioned as a cause by any other actor. The major differences are instead to which extent the different areas contribute and in what state the lake is in now. The Environmental NGO respondent noted that the problems are given attention, but the main difficulty is to do something about it. In other words, it is a management problem. Therefore a more in depth analysis of what values the actors express and its relation to management might give further insights.

4.3 Value categories

The value section of the analysis is divided into two parts. First, the held values in terms of the three values orientations (biospheric, social-altruistic and egoistic) the respondents had will be explored. This is followed by a section on specific value dimensions in relation to water.

4.3.1 Value orientation

The respondents did not clearly belong to one category of value orientations. However, if the orientations are not seen as distinct categories, but as a spectrum, in this context ranging from biospheric to egoistic some differences appear. Moreover, a social-altruistic value orientation can encompass all from community centred benefits to benefits for humans at large, a spectrum can better illustrate the nuances. The value-orientation spectrum with the actors’ position is illustrated in figure 4.

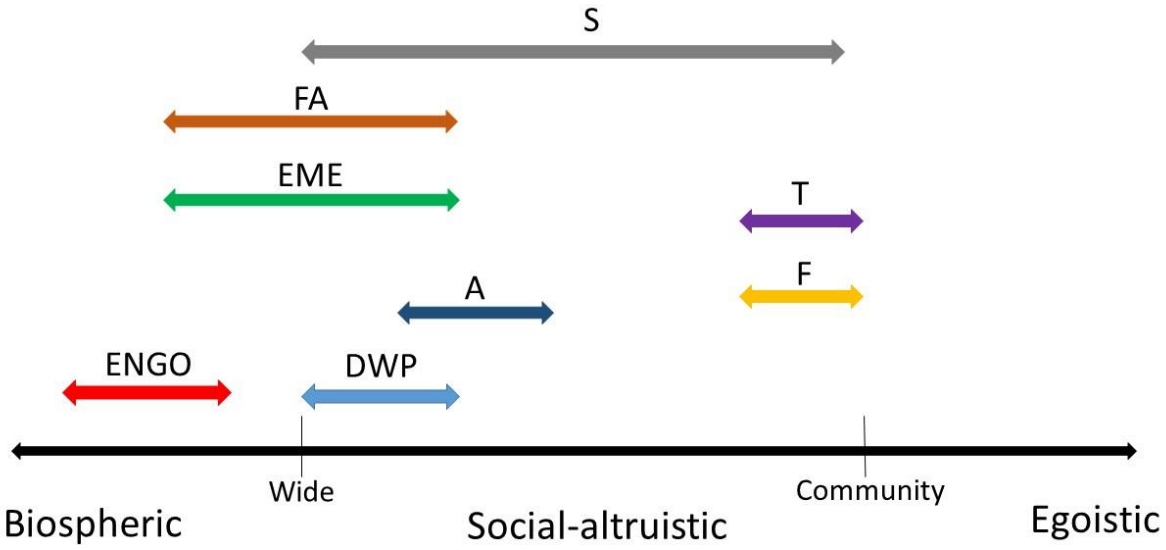

Figure 4: Interpretation of the actors' value orientation (biospheric, social-altruistic, and egoistic) in the form of a spectrum. Also showing differences in a wide social-altruistic value orientation and a community centred social-altruistic value orientation. Abbreviations: A= Agriculture actor, DWP=Drinking water provider, EME= Environmental municipal employee, ENGO= Environmental NGO, FA= Forestry Authority, F= Fisheries, S= Sewage responsible and T=Tourism responsible.

Biospheric

The Environmental NGO respondent is positioned in a biospheric direction. This is visible, for example, when stating that the work the respondent do is just because of liking nature. Further, the biomanipulation strategy was seen as unsuitable, due to it being an "end-of-pipe solution" (meaning that it is just treating the symptoms and not the cause), but also for reasons that it has negative consequences for the fish.

> "…I am not really allowed to kill fish, but they kill a lot of fish so it is a little bit doubtful that you kill animals so that other animals can live, that is not what you are supposed to do, you should remove it in a natural way, if the transparency was better the predatory fish would have taken over. I think it should happen in a natural way." (ENGO 4)

Further, the respondent argued that the ones who pollute should pay for it even if that means that agricultural practices have to stop or be heavily altered. This can be interpreted as that we have to sacrifice or change our way for the benefits of nature.

Biospheric to wide social altruistic

The Environmental municipal employee respondent and the Forestry Authority actor both showed signs towards a biopsheric value orientation combined with a wide social-altruistic orientation. For the former, biodiversity is considered the most important aspect to care for and everything else was seen as second hand priority. The respondent further showed a wide social-altruistic orientation, where what will benefit most people should be favoured and referred to economic values and ecosystem services when discussing what a value constitutes. This in a communicative manner, as the respondent believed seeing the lake and other shared water bodies as an economic resource might help to make other people understand the value.

The Forestry Authority respondent emphasised that all (plants, humans and other animals) should have access to healthy water. Similar to the Environmental NGO actor, the respondent highlighted our relation to other species and that humans should create the opportunity for other species to live well in nature as well as how our actions cannot extinct species. On the other hand, the respondent's profession requires an equal focus on production of forest and its economic implications, and environmental consequences.

> "Forestry means so very much for our country regarding economy so our role is to handle this in the best possible way so we have as small negative effects as possible, and at the same time get as large positive effects as possible economically regarding the forest" (FA1)

The rational the respondent portrays is that due to the large socio-economic interests in forestry in Sweden, for example in terms of employment, it is still preferable to continue the practice, but working for minimising the impacts. This view moves the respondent from biospheric towards a wide socio-altruistic value orientation, since even if the forestry damages water and the species within, the benefits for humans weigh more.

Wide social-altruistic

The Drinking water actor largely emphasised responsibility and in particular responsibility for future generations and portrays a wide social-altruistic value orientation. A healthy nature is primarily seen as something that can benefit people over generations.

> "Well to have a house along the beach only benefits that person who has the house but to have a healthy water and an untouched nature benefits all people who can take part of it and also future generations". (DWP3)

The respondent further, similar to the Environmental municipal employee respondent, favoured using economic values as a tool to justify costly restauration. The respondent saw some difficulties and risks with monetarily valuing natural areas, as some values might be forgotten. However, it was still viewed as a useful tool to increase understanding among the public of the importance of healthy water. The respondent also favoured more restrictions, preferably in terms of water protection areas, to manage a shared water body.

The Agricultural actor also showed a wide view in that you should do what is beneficial for most people. Unlike the Drinking water actor, the respondent does not give any reference to this being to secure for future generations or for the community, but this was spoken in general terms.

> "Then maybe you should see how much you need to change this natural resource in order to make it fit for as many as possible, but interference as little as possible. If you need to build a, if you want 10 times as many commercial fishermen you need to build docks for the boats so maybe that is not the most optimal, but then it is instead better to benefit the recreational fisheries where you can do floating docks and do small intrusions. Because there is still a lot more who can use that type. So as small intrusion as possible so that many can benefit from it … largest amount of happiness" (A2)

Wide to community social-altruistic

The Sewage actor focused on the importance and benefits for humans, both for future generations and for the community.

> "Yes, well it is very important with water protection areas, yes it is for future generations, so it is the only thing you can think, yah because it is now in the process of Lake Ringsjön to be an area of national interest so I don't understand how they will solve that … yes my God, you cannot only say that nothing, it cannot be a dead like, do you understand what I mean, that nothing can be done because people still need to be able to live around in some way." (S2)

On the one hand, water protection areas were seen as important for future generations but the respondent also worried about the accessibility for the community. Unlike the Environmental NGO

actor, this respondent would not see nature protection at the cost of humans' opportunity to use it. This is further emphasised by the wording 'dead lake' for a lake with heavy protection. In addition, the respondent argued that we should care for all waters, because it is important for all humans, something that also indicate a wide social-altruistic orientation.

Community social-altruistic

The Tourism actor emphasised the accessibility, especially for the residents and the visitors in the area. The respondent was already experiencing what the former respondent was worrying about regarding protection.

> "…riparian protection, that is what it is called, which is very very regulated and that is really good but it can also be an obstacle, because somewhere it blocks, we cannot do this due to the riparian protection and we cannot due this due to those nature things and we cannot do this so sometimes I find it that it is easier to blame it than to actually how can we do this without exceeding the law … well it is the residents and actually also the visitors, it is the accessibility that sometimes have to stand back … it is not always so much fun when you see the potential of doing a little but not even a little is possible" (T1)

The respondent points to protection as hindering people from using nature and the opportunity to use nature in one way or another is something that the actor feels strongly about. This was further emphasised when describing a value as "it is something we can use" and a healthy lake is important because "otherwise you cannot use it".

The Fisheries respondent also showed a community focus and stressed the importance of Lake Ringsjön as a resource for the inhabitants. The respondent further discussed values of nature as something connected to a long term focus and emphasised that we should not deprive but improve for the next generation. Regarding future generations, this can also be on different levels from future generations of humans on the planet or very narrow, such as future generations in the family. The respondent seem to see future generations from a community perspective.

> "… I try to do so I think very, not only on myself or ourselves, we think of Lake Ringsjön as a resource. I try to see it as an important resource for all in the best way. And it is not easy, many times to think this way, but you have to think and we have always thought in the long term when we fish here in Ringsjön, that is why we have had fishery here for so many generations that is sustainable today as well" (F5)

The respondent actively work for thinking beyond egoistic views and see the benefits for the community. The respondent is further the only one who labelled Lake Ringsjön 'property', especially in relation to the water withdrawal. The drinking water company was perceived as making money on the water, but not paying for the damages. The actor suggested that the company should repair the damage for those whose property it is (i.e. the community).

4.3.2 Value dimensions

The respondents expressed a number of specific values of different types. What the actors saw as important in relation to water is summarised in figure 5 (for table of which the figure is based on see Appendix C, for explanation of the dimensions see table 2).

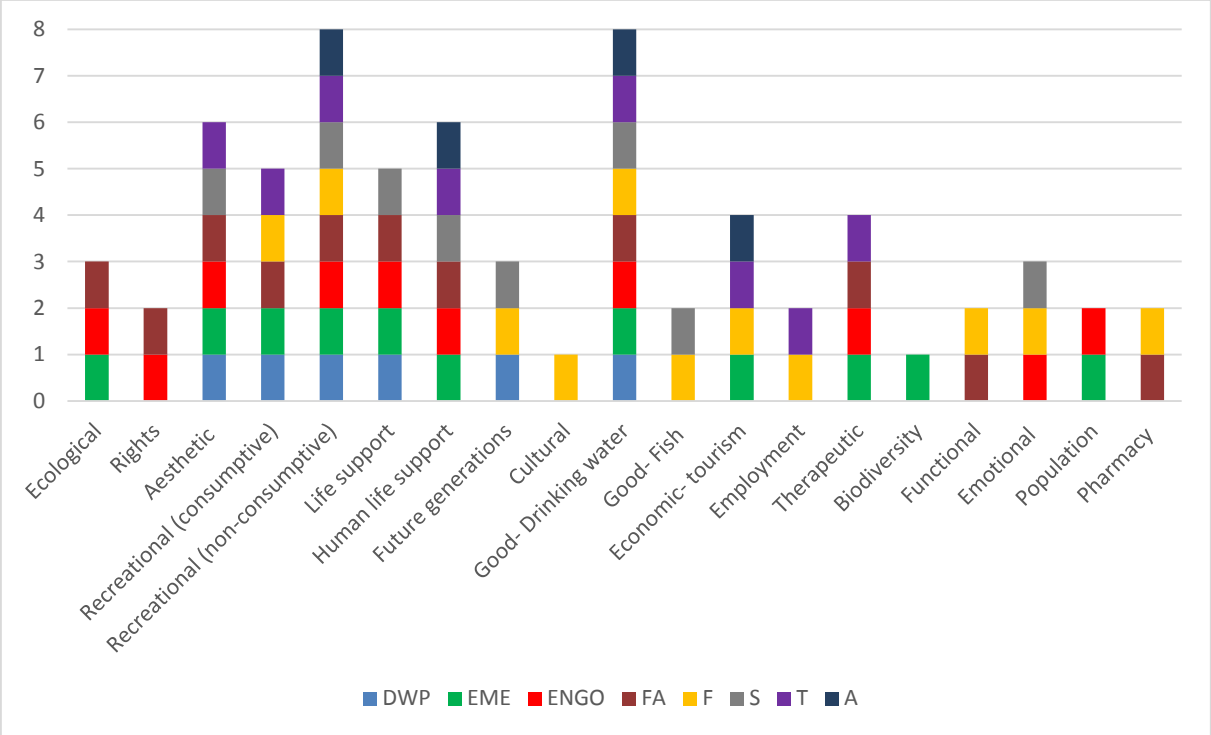

Figure 5: Showing the different values dimensions as interpreted after the actors' expressions. The colours in the stacked bars correspond to the different actors. Abbreviations: A= Agriculture actor, DWP=Drinking water provider, EME= Environmental municipal employee, ENGO= Environmental NGO, FA= Forestry Authority, F= Fisheries, S= Sewage responsible and T=Tourism responsible.

The actors expressed a diversity of values in association with water. Some of the dimensions tend to be more towards intrinsic values (i.e. ecological, rights, life support and biodiversity). However, it can be very difficult to distinguish what the underlying basis of such a value is for the individual as these can be non-use values or in extension be for human benefits.

Overall, the respondents did not focus more on either consumptive values or non-consumptive values. Drinking water was seen as one of the most important, if not the most important, use of water by all respondents. Recreational activities of non-consumptive character (e.g. swimming or hiking) in or adjacent to water was also seen as important by all actors and the aesthetically pleasing features of water was commonly discussed. Further, almost no respondent was alone in stating a value, with the exception of the Environmental municipal employee actor explicitly stating biodiversity and the Fisheries actor expressing the cultural or traditional value of eating eel in Scania. Other than these exceptions, the actors had many values in common, at least with one other respondent.

On an individual basis the respondents showed some differences. The respondent from the Environmental NGO largely focused on non-consumptive values, such as therapeutic and emotional values and those of intrinsic character. This also relates to how the respondent expressed a 'nature value', as "that the harmony is still there in nature". The respondent from the Forestry Authority, saw a large variety of values as important, ranging from those of more intrinsic character to human life-supporting values, such as the economic importance of water for forestry. This range was also shown in how the respondent described values. A 'nature value' was seen giving the opportunity for species to live, but a value in general was expressed in economic terms. The respondents with a community focus in their value orientation, were also the ones expressing the employment value of fisheries. Given that the Tourism actor described a value as something that can be used, but not limited to consumptive uses, this was further emphasised in that several non-consumptive values (i.e. aesthetic, therapeutic and non-consumptive recreational) were seen as important. The Drinking water respondent also focused on recreational values, both of consumptive and non-consumptive kind. The Agriculture respondent described a value in economic terms and that it does not have 'real value' until scarce. The values this respondent mentioned was human life support, drinking water, recreational activities and tourism, of which the first two are connected to our immediate need for water.

5. Discussion

Values can be an important factor for effective management and diverse values can lead to disputes over shared natural places, both in terms of value orientation and more specific values such as consumptive versus non-consumptive and intrinsic value. The aim of this study was to explore the values actors in the region showed towards water in general and the lake specifically. In extension to inform future management, to avoid conflict and increase the ability to cooperate. It is again important to note that the respondents are individuals, belonging to one organisation within one sector and should not be interpreted as an entire sectors' view. Four of the respondents are active in the water council and the other four are, at this point, not involved in the council. The findings indicate that there are differences, but also similarities among the actors' values. If Lake Ringsjön were to become a water protection area in the future, insights about these values might be useful for understanding the different views the actors might have towards the potential protection. In this section I will first discuss the management implications of my findings. This is followed by a discussion centred on potential barriers to effective cooperation and ways forward. Last in this section I discuss some limitations in relation to value concepts and the study.

5.1 Management implications

A shared understanding on what constitutes a 'value' is one important component for functioning management and effective communication (Reser & Bentrupperbäumer, 2005). The respondents showed different ways of describing a value, ranging from something we can use, to something related to harmony in nature. The respondents who were members of the water council did not show a more similar view on the meaning of 'value' than the other respondents. This can be explained by the respondents stating that 'values' are not something the council discusses. These different perceptions might be problematic since the same word, 'nature value' is commonly used in relation to natural places and by some of the respondents as well, but if the actors mean different things, it can lead to misunderstandings and hinder communication.

Not only what was seen as a 'nature value' differed between the respondents, but also what constitutes as 'natural'. Brooks (1976) refers to 'natural' as to something that has been allowed to evolve free without human intervention. Different perceptions of 'natural' was especially visible for two of the respondents and affected the perceived suitability of biomanipulation strategy. The Environmental NGO respondent, perceived the reduction fishing as unnatural and the Fisheries respondent perceived the amount of cyprinid fish as unnatural. The Environmental municipal employee respondent reflected of the own word choice in this context, when calling the

biomanipulation, not *restoring* but *adjusting*, which implies an active involvement of humans and that humans cannot *restore* to some kind of 'natural' state.

Many of the respondents perceived all actors in the region as wanting the same thing in the end, and that is a quality of water which is considered 'healthy'. However, what constitutes a 'healthy lake' and the underlying reasons for a healthy lake can differ, especially if you have different point of reference. This was seen in the different perceptions the respondents had of the status of the lake today, when some named it horrible while others viewed it as being in a better state than ever. As noted by Thompson and Barton (1994), both an anthropocentric and an ecocentric view can indicate environmental concern, but the actions one will support might differ. For example, the Environmental NGO respondent had the perception that no one had an interest in a healthy lake. This respondent was also the one who were furthest towards a biospheric value orientation. Therefore the perception of feeling alone might be due to others not expressing the same reasons for why the lake should be healthy. If compared to, for example, the respondent from the tourism sector, who saw a healthy lake as having a 'use' value, this might lead to different views on how healthy it needs to be and at what cost. Increased protection might decrease pollutants into the water substantially, but at the cost of the 'use' value and accessibility.

In the respondents value orientation some spatial and temporal differences regarding benefits for humans could be seen. The Fisheries respondent and the Tourism respondent had a community social-altruistic value orientation. In other words, the benefits of water or aspects of water was mainly seen through the eyes of the community. On the other hand, the Environmental municipal employee and the Drinking water respondent mainly discussed benefits in a larger perspective, and therefore some activities might have to stand back for those that benefit more people. Further, the respondent from the Forest Authority spoke in terms of the benefits for Sweden and the respondent from the Environmental NGO primarily focused on benefits for nature. The latter's view was also shared to some extent by the Forestry Authority respondent and the Environmental municipal employee. However, the two seemed to differentiate between their professional role and their personal view. The Environmental municipal employee exemplified that while recreational and aesthetic aspects were personally valued, in relation to the professional role, more attention was given to technical aspects. This divide can indicate that although the individual see many different values, management is restricted to more consumptive values. This also highlights that there might be a need to include a wide range of values in management and consider them of equal weight.

If the lake were to become a water protection area in the future, the different value orientations might give indications to how well the protection will be received. A water protection area will benefit

drinking water provision for the urban residents in Scania, but might restrict activities for the community. The respondents with a community centred focus might resist this idea. This divide between rural and urban has been seen to spark conflict before (Jackson et al., 2008). All respondents viewed drinking water as the most important good and shared values among the actors can provide useful information to engage the different sectors in management (Seymour et al., 2011; Stein et al., 1999). However, although drinking water was seen as very important for all actors, protection for a reserve reservoir for the cities in southern Scania, might be viewed differently if what you value is the community.

5.2 Ways forward and potential barriers

The respondents had many specific values in common in relation to water and the lake. However, they had rather different understandings of the state of the lake today and some differences in the main reason for this state. This might be reflected in different views on suitable management. If the status of the lake is seen as improved, the current management course might be seen as more suitable and additional restrictions or efforts may come with hesitation. On the other hand, if the status is seen as poor now, these respondents might favour additional efforts to improve the status.

It can therefore be of importance to create a shared understanding of the problem by identifying the problem together (Lang et al., 2012). This might be increasingly difficult, but even more important, as different value orientation can bias an individual to reject information that is not in line with the value orientation (Stern, 2000). Another potential problems can arise when actors pursue their goal in isolation (Ayling & Kelly, 1997). To avoid this, 'backcasting' (e.g. Swart, Raskin & Robinson, 2004) might be useful to first identify what the common goal is, followed by solutions to get there. In this context, the goal was perceived as shared by many of the respondents, but clearly expressing perceptions of what a healthy lake looks like and for whom the lake should be healthy, might increase understandings. An understanding of values can help in this process to facilitate communication of why certain aspects are seen as more important for some than others and to increase understanding of why there might be resistance. However, for this to be successful, all actors must be interested in communicating and in reaching collaborative solutions (Ayling & Kelly, 1997). Several actors mentioned cooperation, conversation and compromise as being of importance when sharing a resource, which indicate that there is an interest in reaching agreements in general among the actors. However, some actors had some rather strong opinions about each other's practices, but an understanding and increased communication about values might help in understanding the different actors' rationale.

How to communicate the value of water was discussed by some of the respondents. Expressing values in economic terms through ecosystem services was seen as important for two of the water council actives, such as the Environmental municipal employee- and Drinking water respondents. This was seen as a tool for increasing understanding of the importance of water, a strategic way of using ecosystem services (MacCauley, 2006). Overall, the respondents seem to see the lake and water in general as more than an economic good but some argued that it might have to be reduced to economic terms for people to understand the value. On the other hand, the Tourism respondent, for example, rejected the idea of economic valuation to communicate values as this carried the risk of consumptive values being favoured. When values are seen through ecosystem services there is a risk that tangible services such as goods come in focus, while the more intangible, such as regulating services have the risk of being underrepresented (MacDonald et al., 2013). In extension, as ecosystem services rarely operate in isolation in nature, attempts to maximize one ecosystem service can result in a decline of other services (Bennett, Peterson & Gordon, 2009; Raudsepp-Hearne, Peterson & Bennett, 2010). With these risks in mind, solely focusing on ecosystem services might result in that therapeutic and emotional values of water expressed by the Tourism- and Environmental NGO respondents, but also the aesthetic and life supporting values, expressed by the Environmental municipal employee and Drinking water respondent themselves, to be underrepresented.

5.3 Limitations of the study

The former section discussed the findings in terms of values and the implications this has for management and effective cooperation on a practical and local level. This study focused on values, but there are other aspect that affect the possibility to share a water body of which value concepts does not depict. One of those aspects are power relations (Ayling & Kelly, 1997; Dietz et al., 2003). If there is a power imbalance between the parties, the values of some might not be taken into account or even get a chance to be raised. Additionally, there are some practical aspects and physical features of the shared natural place that can make it easier to share (Dietz et al., 2003). That is, for example, how easy it is to monitor the resource and the extraction of it, level of uncertainty in changes of the shared resource and level of communication among the actors (Dietz et al., 2003). Further, a more extensive study, with more respondents from each activity might have given additional insights to differences and similarities among the activities.

6. Conclusion

The values people have and direct towards the environment can impact management and also lead to disputes over the most suitable management alternative. This thesis aimed at exploring such values and the implications it has for sharing water. The findings show that actors sharing the water body have both similarities and differences in value orientation and specific values associated with water. The term 'nature value' was used by several respondents, but what characterises a 'nature value' differed. In addition, the different value orientations showed that the respondents spoke about benefits on different spatial and temporal levels. The respondents further showed different perceptions of the state of the lake and the reasons for it. These aspects might lead to difficulties in understanding each other. A clear definition of the problem at hand, the goal and what 'nature value' means within the specific context, might make communication easier. An understanding of different values might assist in such a communication. Insights on values does not *solve* disputes or *lead* to more effective management. However, it can serve as a basis for understanding *why* it is difficult to agree or *why* there are different views on suitable management. If values can be understood and expressed more clearly, it can facilitate communication to reach ways forward that are accepted by all parties involved.

This thesis served as a starting point for a larger project on how to understand and communicate "values of water". There are several possible ways to build on this study. In relation to the specific case, a follow-up study with residents in the area might provide additional insights to effective management and highlight differences and similarities between the actors and other stakeholder. This can also be used for 'mapping out' differences and potential problem areas, as well as give insights to shared values in order to steer the management in a direction that is accepted by all stakeholders. Another possible way forward for future research is to investigate the relative value of water in relation to other parts of the landscape by focusing on trade-offs. Last, research on how to integrate value concepts in participatory management processes might give further insights on how to practically work with these concepts.

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Appendices

Appendix A- Interview guide

(Translated from Swedish)

First I would like to thank you for taking the time to participate in this interview. I contacted you because you are active or work with or in relation to Ringsjöarna.

As I described before, I am doing my thesis in collaboration with Sweden Water Research as the last part of my education in Environmental Studies and Sustainability Science at Lund University. I am interested in how different actors, sharing a water body, experience it and their perceptions of the lake and water. I am also interested what values are associated with water, how that influences management and how values can be incorporated into management.

The interview consists of three parts, first more specifically on Ringsjöarna, then questions on the water council and last a more general part where the focus is more on your perceptions and experiences of water in general. If there is anything you do not understand, just ask for clarification. If there is anything you do not want to answer just say so. I am interested in your thoughts and experiences so there are no right and wrong answer to these questions. I also hope we will have as much of a dialogue as possible so feel free to develop your thoughts from the questions. I will use quotations in my report, but I will not use names. Is there anything you would like to ask before we start?

First we start with the questions regarding Ringsjöarna specifically

1. How many years have you been active in or worked with Ringsjön?

2. What do you do in relation to Ringsjön more specifically? Do you visit the lake in your spare time as well?

3. Did you grow up in the area around the lake? How do you think that growing up here/not growing up here affects the relationship you have to the lake?

4. In the mass media there has been some news regarding, for example, eutrophication in Ringsjön and several projects have been carried out, how would you describe the status of the lake today?

5. Can you tell me a little bit about why you started to be interested in the lake?

Now we will move on to questions regarding the water council

If the respondent has taken part in the council:

1. How many years have you been part of the water council?

2. Do you think there are differences among the members of the water council regarding the management of Ringsjön? If there are no differences, why do you think that is? If there are differences, how would you describe them, what kind of differences?

3. Has the water council ever been in disagreement? If no, what do you think makes you get along so well? If yes, can you tell me a little bit more about the disagreement?

4. People can have different perceptions about a resource, do you think there are different perceptions of water in the water council? Why/why not?

5. Do you ever discuss values regarding water or different perceptions of water in the council? If no, what do you think such a discussion would have led to? If yes, can you tell me a little bit more of what you talked about then?

If the respondent has not taken part in the council:

1. What do you know about the water council?

2. What are your general experiences of the council as an organisation and its role?

3. Do you think there are disagreements in the council? Have you ever disagreed with the council's practices?

4. Is there any protection of the lake or regulations that have affected you personally or in your work, positively or negatively?

5. Do you discuss values regarding water in your organisation? If no, what do you think such a discussion would have led to? If yes, can you tell me a little bit more about what you talked about then?

6. People can have different perceptions about a resource, do you think it differs between people around the lake? Why/why not?

Now we move on the last part, which is more general and where focus is on the experiences and perceptions you have.

1. Do you think there are certain uses or activities of water and around water that are more important than others?

2. A) Do you think different uses or activities of water can be prioritized?

2. B) In that case, how would you prioritize?

3. Is there any use or activity in or around a water resource that you think is very important, but which does not get so much attention in management, something you think is important but that is often forgotten? If yes, which one/ones, Why that one/those ones? If no, why do you think that is?

4. How would you solve a situation when many want access to a resource?

Now I have 20 pictures here that are related to water in some way and then you can choose five of them which you best think represent the way you think about water.

1. Can you tell me a little bit about why you chose these ones?

2. Is there any picture that you think is missing? What would it have shown?

3. Do you see anything in common with the pictures you chose? Why do you think you think about water in this way?

4. If you would describe water, what traits would you say it has?

5. The way of viewing values and for example nature values (Naturvärden) can vary. How would you describe a nature value? How would you describe a value or several values?

6. Is there anything you would like to talk about that we have not discussed?

Appendix B – Original quotations

After appearance in text

“Det finns ju då människor som tycker då det var sen Sydvatten börja reglera sjön som alla dom här problemen uppstod så att vissa har, lever i den villfarelsen att det är sydvatten som gjort att det är så dåligt vatten i Ringsjön.”(DWP1)

“Och det gjorde att väldigt kanske bara en 10% av rommen klara sig, men det blev rätt mängd asså den naturliga sättet, så ska det va så att sen när du reglerar sjön, då håller man sjön ända till augusti månad där man gör ett utsläpp, man släpper ut lite men inte alls i den omfattningen så att sjöns börjar ju inte sjunka förrän på sommaren va och då är det ju så att alla som leker uppe på dom områdena, det blir ju 100% överlevnad på rommen” (F1)

“Fastän många tycker att man är på andra sidan eftersom vi är ett avloppsreningsverk så tycker dom att vi är miljöbovar fastän vi bara renar det vatten som alla använder så är vi egentligen miljöhjältar tycker jag, hade inte vi funnits hade allting bara runnit ut” (S1)

“Jag använder inte Ringsjön direkt utan jag mer, vatten som kommer från fastigheten som rinner ut i ringsjön va … det är svårt att värdera andras utnyttjande av sjön eftersom inte jag utnyttjar den så är det så … asså man försöker ju se till så man har kantzoner och så som skyddar så man inte läcker näringsämne rakt ut i bäckar och så. Hålla lite distans till vattnet… som man har sett den innan när det blomma jättemycket så tänker man ju efter lite vad man gör för att minska att det kommer tillbaka.” (A1)

“Det är viktigt att det är ett klart och fint vatten och en del där är skillnaden, en del vill ju ha som ett rent badvatten, väldigt klar sikt och sen är det någon som vill ha att det är bra asså att det är ett bra vatten va, men alla asså bra vatten kan ju va fast det inte är jättebra siktdjup” (F2)

“Oftast det låter så illa och för många när det kommer en liten sjö när det kommer en yrkesfiskare som ska dit, ja men nu kommer han dit till sjön, nu kommer han, nu kommer det inte finnas en fisk kvar, men det är fel … det är väldigt få som vet att det är yrkesfiske i ringsjön, stort yrkesfiske att det blir lite får lite i skymundan i det hela, hade du inte haft ett yrkesfiske i ringsjön, du kan ju bara tänka dig dom

all dom ton vitfisk vi tar upp, skulle inte dom tas upp asså, jag kan säga att det framförallt, hade havererat direct" (F3)

"… vi lägger ner enorma resurser på att att återställa, jag gillar inte återställa, att justera balansen i ekosystem i sjön va och sen har vi yrkesfiskare som jobbar stenhårt för att då ehh fördärva den balansen som som vi försöker åstadkomma, genom att dom plockar upp rovfisk och att dom plockar upp stor rovfisk" (EME1)

"Det är bönderna som inte vill betala och sen är det då dom som vill tjäna pengar på att ha en sjö som är ren, men dom har ju hitintills inte intresserad av att betala för det. … jag är ju inte intresserad av att tjäna pengar jag har ingenting att förlora så att säga med om det skulle bli krav på bättre rening så jag gör det liksom bara för att jag tycker att det är, jag gillar nature" (ENGO1)

"Jag tror egentligen inte att nån så att säga ser värdet i en ren sjö" (ENGO2)

"Fast det här med att ha ett rent vatten det borde inte vara så lätt eller det borde inte vara så svårt att samsas om ju" (DWP2)

"… men det stora problemet har varit det här med vitfiskproblemet, alltså man gjorde en reglering I sjön, en reglering som har fördärvat sjön va för det tar ju ett antal år innan det märks att en sjö förändrats va".(F4)

"Det är ungefär som att kissa i byxorna man man blir varm en kort stund och sen när man slutar så blir det kallt igen va och ännu värre"(ENGO3)

"…får jag ju egentligen inte döda djur alltså men dom dödar ju massor av djur alltså så det är ju lite tveksamt att man dödar djur för att andra djur ska få leva, det är ju inte det man ska göra man ska ju ta bort det där på naturlig om det bara hade blivit bättre sikt hade ju rovfiskarna tagit över jag tycker att det ska ske på naturligt sätt" (ENGO4)

"Skogsbruket betyder så väldigt mycket för vårt land när det gäller ekonomin så det är vår roll att hantera detta på ett bra sätt så att vi får så små effekter som möjligt negativa och samtidigt som vi får så stora och bra effekter som möjligt ekonomiskt när det gäller skogen." (FA1)

"alltså att ha ett hus vid stranden det gynnar ju bara precis den personen som har huset va ehh men så att säga att att ha ett friskt vatten och en en orörd natur gynnar ju liksom alla människor som som som kan ta del av det och även kommande generationer såhär va" (DWP3)

”då kanske man ska se till hur mycket man behöver förändra den här naturresursen för det liksom ska passa så många som möjligt, men göra så lite ingrepp som möjligt. Behöver man bygga en, om man vill ha en 10 ggr så många yrkesfiskare och man behöver bygga liksom hamnar för att få in båtarna så så kanske det inte är det som är det optimala utan då är det bättre att gynna fritidsfiskarna som där man kan göra flytbryggor och göra små ingrepp. För det är ändå många fler som kan utnyttja den typ. Så för lite ingrepp som möjligt för att fler ska få glädje av det. … största möjliga lycka typ”(A2)

”jo asså det är jätteviktigt med vattenskyddsområde, mm är det för framtida generationer så det är det enda man kan tänka usch ja för det är pågång nu att ringsjöarna ska bli riksintresse så jag förstår inte hur dom ska lösa detta … ja herregud ja man kan inte bara säga att ingenting får det kan ju inte va liksom bli död sjö men du förstår vad jag menar att ingenting får göras för folk måste ändå kunna bo och leva runt på nåt sätt ju”(S2)

“Strandskyddet heter det ju som är väldigt väldigt reglerat och det är jättebra att det är det men ibland så kan det ju också bli ett hinder för det är nånstans blir det ett stopp också, ja men vi kan inte göra detta för strandskyddet, vi kan inte göra detta pga. av dom naturgrejerna vi kan inte göra så ibland så kan jag uppleva att det är lättare att säga ja vi har ju dom där lagen men den kanske också ger utrymme. det är lättare att skylla på den än att faktiskt tänka hur kan vi göra utan att vi går över lagen… ja det är ju medborgarna och det är ju faktiskt också besökarna, det är ju tillgängligheten som ibland får stå tillbaka […] det är ju inte alltid så kul när man liksom ser en potential att göra nånting och där man skulle kunna göra litegrann men det inte ens blir litegrann”(T1)

”… jag försöker göra så att jag tänker väldigt, inte bara på mig själv eller på oss själva vi tänker på ringsjön är en resurs, jag försöker ju se som att vi det är en viktig resurs för alla på bästa sätt. Och det är inte lätt, många gånger att tänka så men man måste tänka och vi har alltid tänkt långsiktigt när vi fiskar här i ringsjön, det är därför vi haft ett fiske i så många generationer som är hållbart idag också”(F5)

Appendix C- Value dimensions

Value dimensions with respondents' terms and the respondents stating it. (A=Agriculture, DWP= Drinking water provider, EME= Environmental municipal employee, ENGO= Environmental NGO, F=Fisheries, FA= Forestry Authority, S=Sewage and T=Tourism.

Respondents terms	Value dimension	Respondent stated
'if the biology does not work everything else will fall' 'a normal life for animals' 'variation is necessary to not extinct things', 'ecosystems are connected'	Ecological	FA, EME, ENGO
'we do not have the right to eradicate species', 'you should not kill animals so that other animals can live'	Rights	FA, ENGO
'hiking' 'swimming', 'recreation', 'experiencing nature', 'boating', 'canoeing' 'skating', 'photographing', 'recreational aspects' 'birdwatching'	Recreational (non-consumptive)	All respondents
'hunting' 'if it is not clean, you cannot fish in it' 'recreational fishing',	Recreational (consumptive)	FA, DWP, F, T, EME
'beautiful environment', amazing scenery' 'love listening to waves and rivers' 'beautiful environments' 'a soft value, purely aesthetical', 'enjoy the view' 'unaffected forest streams', 'untouched lakes'	Aesthetic	FA, T, EME, ENGO, S, DWP

’plants, animals, humans dependent on water’ ‘you cannot replace it’ ‘prerequisite for all life’ ‘one of life’s most important elements’ ‘all life is dependent on water’ ‘for all life on Earth, but also particularly life in water’ ‘Connected in an endless cycle’ ‘the process, same water molecules that has been here for millions of years’ ‘understand how everything is connected’	Life support	FA, DWP, EME, ENGO, S,
’long term healthy water for future generations’, ‘do not deprive for the next generation’, ‘water protection for future generations’	Future generations	S, DWP, F
’share what we have in terms of water’, ‘we who have good quality water might have to share this, equal share of this resource’	Population	ENGO, EME
’drinking water most fundamental’ ‘Drinking water first hand’, ‘drinking water as part of a sustainable society’ ‘water resource for drinking water’ ‘drinking water, the most important thing we have’ ‘drinking water is important’ ‘drinking water number 1’	Good/economic Drinking water	All respondents
‘fresh, healthy fish’ ‘fish is something people should eat’	Good/economic Fish	S, F
‘ for tourists as well’ ‘tourism in general’ ‘tourism’ ‘important for the tourism sector’	Economic Tourism	A, F, EME, T
‘Fishing gives an income’, , ‘we [fisheries] employ more than just the fishermen’	Employment	T, F
’biodiversity is the basis’	Biodiversity	EME

’species we can use in the form of medical products’, ‘high blood lipids then you should eat eel’	Pharmacy	FA, F
‘national meal to eat smoked eel’	Cultural/traditional	F
‘Load the batteries’, ‘harmony for the soul’, ‘peace for the soul’ ‘calming’ ‘feel good, then you don’t have to go to the doctor’, ‘finding yourself’, ‘relaxing’	Therapeutic	ENGO, EME, T, FA
‘water as a resource for food’ ‘water is important for all humans’ ‘we consist of 80% water, it is vital, nothing can replace water’ ‘remember that we consist of 70% water, water is vital for us all’ ‘without clean water we could not live’ ’water resource, irrigation’ ‘water is important for all humans’ ‘we don’t survive without it’, ‘you should be able to use water’, ‘dependent on the rain [to grow food]’, ’energy, our hydroelectric power stations’,‘lowered ground water levels affect forestry economically negative’	Human life support	A, S, ENGO, EME, T, FA
‘it affects my feelings’ ‘care for all water’	Emotional	ENGO, S, F,
’the use among species’ ‘the water disappear, species disappear, maybe prey to species on land who will be affected’ ‘coral reefs important otherwise no fish in the ocean, no life’	Functional	FA, F