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Addressing the gap between participatory ideals and the reality of environmental management: The case of the cormorant population in Finland

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Abstract

Environmental management, similar to public management generally, is increasingly challenged by an ever more complex society. Generally, in scientific literature, participatory features are presented as solutions for adapting centrally steered management to local circumstances and for mitigating conflicts. This article argues that local realities and transformations are easily neglected in environmental management due to unsuccessful implementation of its own participatory ideals. By studying the management of cormorant–human conflicts in Finland, the article identifies critical features that can be implemented to overcome the gap between participatory ideals and the reality of environmental management. By interviewing locals and civil servants and by directing questionnaires to fishers, the article presents how management and science look for dependencies between cormorants, fish stocks, and water nutrition, although fishers and locals are primarily concerned with the combination of seal- and cormorant-induced damages, the changed behaviour of fish, and reduced recreational possibilities. Narrow scientific approaches and the national interpretation of the EU Birds directive thereby impede the management system from perceiving the complete local impact of a growing cormorant population. This article identifies obstacles hindering a balanced environmental management policy and concludes that there is a need to reinforce (a) social scientific approaches; (b) vertical negotiations at the local, national, and supranational level; and (c) the training of civil servants as facilitators of communication.

KEYWORDS

cormorant, environmental management, fisheries management, knowledge economy, participation, postproductivism

1 | INTRODUCTION

The participation of stakeholders in environmental management is increasingly advocated in international environmental treaties and in national government directives. Participatory ideals, however, are not always put into practice successfully. The aim of this article is to

address this apparent gap between participatory ideals and the reality of environmental management. We study the reasons and consequences for this gap in the context of managing cormorant–human conflicts in Finland. As core reasons, we consider the hegemony of ecological sciences, the incongruity of ecological and social sciences, and the difficulty of offering local knowledge a legitimate position in

environmental management systems. On the basis of the analysis, we suggest critical features for overcoming the gap between participatory ideals and the reality of environmental management.

We see a gradual acceptance of the suggestion that “many of the serious, recurring problems in natural resource use and management stem precisely from the lack of recognition that ecosystems and the social systems that use and depend on them are inextricably linked” (Folke et al., 2010). Accordingly, concepts such as the *Social-Ecological Systems Framework* and *Ecosystem Services* have emerged to emphasise the implicit interdependence of social and ecological systems. The level of implementation and the success of this new paradigm, however, is doubtful. The critique is fuelled by the fact that environmental problems have continued to expand despite increasing conservation efforts, with climate change and the exhaustion of natural resources as the most obvious examples. In practice, knowledge integration across the boundaries of social and natural sciences is not widespread, as it is blocked by the specialisation of theories and their competing forms of explanation and interpretation (Bruckmeier, 2016).

The point of departure in this article is the seemingly perpetuate position of management tools lacking the ability to apprehend contemporary social circumstances and fulfil participatory ideals, which in turn aggravate conflicts, eventually rendering environmental management unsuccessful. As an example, we highlight the evolution of society in rural areas, where most cases of environmental conflicts are situated. We suggest that current management tools are too limited for handling the natural-resource-related conflicts in the contemporary rural areas characterised by the knowledge economy and multiple postproductivist ideas and activities.

The cormorant is a mobile, opportunistic, fish-eating bird that has steadily expanded its European range, frequently coming into conflict with human fisheries interests, be they recreational angling, commercial fishing, or fish farming (Carss, Bell, & Marzano, 2012). These animal-related conflicts are, however, more human-human than human-cormorant in nature. In the Finnish case, the conflicts stem mostly from cormorant-induced damage and the inconvenience experienced by commercial fishers and recreational users of the coastal areas (Salmi, 2009a). With the help of this empirical study, we study how the environmental management system is connected—or disconnected—with the interests, values, and knowledge of the stakeholder groups and what the opportunities are for overcoming the gaps. The case study also reveals the power position that environmental management has reached in fisheries governance.

The following section of this article explores participatory features in management generally, whereas the third section demonstrates the importance of considering the characteristics of a postproductivist knowledge economy in environmental management. Thereafter, we present the case of environmental management in Finland. Specifically, we focus on local implications surrounding the handling of cormorants in the region of Ostrobothnia as an example of the deficiencies of top-down and ecology-based environmental management. The discussion and conclusions suggest new tools for improving and balancing the processes within environmental management.

2 | PARTICIPATION WITHIN ENVIRONMENTAL AND FISHERIES MANAGEMENT

Prior to the 1990s, environmental management was “state stewardship of the environment ... applied in a largely ‘top-down’ manner, implementing and enforcing environmental policies in the main by coercion (through laws, fines and closure for breaches of regulation)” (Barrow, 2005, p. 20). The participation of stakeholders within environmental decision making was widely introduced in the 1990s (Virapongse et al., 2016). Concepts such as adaptive management, comanagement, and collaborative governance responded to growing uncertainty and social complexity in order to encourage knowledge generation and learning (Armitage, Berkes, & Doubleday, 2010; Emerson, Nabatchi, & Balogh, 2012; Sandström, 2009). According to these ideas, increased participation would make local circumstances visible to management and prevent conflicts and legal complaints in the implementation phase (Sørensen & Torfing, 2007). As a consequence, it has been claimed that environmental management should not any longer merely be defined as the enforcement of policies and laws, but as a multilevel process involving several stakeholders (Barrow, 2005). Consequently, we investigate environmental management as a broad multilevel process, involving policies, laws, and institutionalised norms, including interpretation of law. This implies that national institutional set-ups may vary within the same supranational setting, as in the case of the EU studied here, and regional institutional set-ups may vary within the same nation state, for instance, with different levels of collaborative features.

International treaties, such as the Aarhus Convention, advocated collaborative features in environmental management and were enacted widely. We divide the participatory ideals into four categories (Berkes, 2007; Reed, 2008):

- Power sharing: providing citizens with responsibility, legitimacy, transparency, accountability, and empowerment
- Building trust: learning to respect differences and understand other perspectives
- Moving towards the integration of knowledge systems
- Social learning: iterative social and ecological feedback, learning-by-doing, and problem solving

The comanagement approach has been developed particularly in the fisheries sector, where cooperative decision making between resource users and managers was seen as an answer to failed top-down fisheries policies. Later, this perspective was widened towards cogovernance encompassing various forms of interaction between interest groups, whether in the state, the civil society, or in the market (Kooiman, Bavinck, Jentoft, & Pullin, 2005). Collaborative governance and adaptive management constituted a part of the wider development of democracy towards deliberative ideals, where participation in deliberative discussions was expected to improve legitimacy, trust, quality of decisions, and so on (Dryzek, 2000). Commonly, stakeholders in a particular issue are invited to take part in workshops or

other forms of meetings. Opportunities for participation need to be opened at an early phase in the decision processes when all options are still available and when the participation process is able to have real influence on the particular issue (Reed, 2008; Nordberg, 2014).

Regarding the governance of carnivores, collaborative governance has been a preferred method for improving local acceptance, for instance, when managing wolves in the Nordic countries (Hansson-Forman, Reimerson, Sjölander-Lindqvist, & Sandström, 2018). Sjölander-Lindqvist, Johansson, and Sandström (2015) argue that the success of such governance is dependent on understanding individual and collective responses. The former is dependent on factors such as environmental and wildlife value orientation, coexistence with carnivores, relationships with local communities, involvement in nature-related activities, and personal characteristics such as age, gender, norms, and knowledge. The latter is determined by formal and informal norms and the ability of management practices to appease individual and collective reactions. In this manner, Sjölander-Lindqvist et al. argue that individual factors need to be understood in the wider political, social, and cultural context. Factors such as representation, knowledge spheres, communication, and leadership are seen as vital for successful carnivore management (Sjölander-Lindqvist et al., 2015, pp. 179–182). Hiedanpää (2013) convincingly illustrates how the neglect of “habits, customs, and purposes” in management decisions aggravate human–wolf conflicts in Finland and even cause a decline of an endangered wolf population by inciting civil disobedience. Finnish wolf management uses fines and other punishments, which are aimed at altering human reactions. Instead, Hiedanpää suggests that authorities should not criticise local habits but encourage their development. This entails a deep understanding of local culture and the development of shared visions.

Recently, the deliberative ideals have been criticised for not reaching their potential. Lundmark and Matti (2015), investigating large carnivore conflicts, argue that the polarisation of interests regarding such issues hamper the ability to find compromises. Hansson-Forman et al. (2018, p. 12) call for empirical testing of the basic assumptions of deliberative theory. Redpath et al. (2017, p. 2160) point out that there are few evaluations of collaborative governance in conservation and that “we are certainly far from being able to design the ideal collaborative process.” Sjölander-Lindqvist et al. (2015, p. 179) see deficiencies in representation and dialogue quality in meetings. This is in line with the critique of deliberative democracy delivered by Mouffe (2013), who argues that striving for consensus ignores the political dimension of societal issues, that is, by suppressing the possibilities to solve conflicts. Mouffe instead advocates an agonistic approach, where participants “agree to disagree” in order to be able to deal with the key issues of the conflict. In parallel with these difficulties, the ability of environmental management to include social and cultural studies has also been criticised. In marine planning, for instance, the focus is on ecological aspects, whereas social and cultural analyses are often missing or dealt with only through brief public meetings (Flannery, Healy, & Luna, 2018). Consequently, in order to reach the ideals of participation, and to adapt the participation models to local social-ecological circumstances, further development of the

role of social science in environmental management is needed. In the next section, we will advance this argument by presenting the concept of postproductivism and reflect the increasing significance of knowledge, knowledge use, and interdisciplinary research—aspects that significantly affect the reality of environmental management.

3 | THE KNOWLEDGE ECONOMY AS A CHALLENGE TO ENVIRONMENTAL MANAGEMENT

The knowledge economy, in contrast to *the industrial economy*, is characterised by regional and local innovation systems, where knowledge is decisive for successful economic development (Halkier, James, Dahlström, & Manniche, 2012; Powell & Snellman, 2004). The importance of *symbolic knowledge* is growing, for example, in the form of art, design, culture, storytelling, marketing, and branding (Asheim, Boschma, & Cooke, 2011). Products have been subject to “culturification” (Nordberg, 2017, p. 43), implying that the content and/or image of the product is of stronger importance than the physical object. Company brands have even become important parts of people's identities (Elliott & Wattanasuwan, 1998). Accordingly, the value of the brand often exceeds the value of the physical product (Arvidsson, 2006, p. 5). Of special importance is the value of local and tacit knowledge, in other words, the kind of knowledge primarily produced and communicated through informal contacts and learning processes. These may be practical solutions, local culture, norms, and even trust and social cohesion (Fonte, 2008, p. 210). Such knowledge is used in production processes and is even vital for the performance of the innovation system. The latter is highlighted in the literature on entrepreneurship (Krueger & Brazeal, 1994), and it is possible to distinguish economically weak regions by low levels of trust and cohesion (Bradford, 2012, p. 5).

The development towards a knowledge economy is visible also in rural areas, where the economy is said to be characterised by *postproductivism*, with an increased search for recreation and a growing emphasis of environmental protection. Although the economic significance of quantity-oriented primary production has decreased, activities such as commuting, tourism, second home dwelling, and new kinds of entrepreneurship are becoming vital for the survival of rural communities (Morgan, Marsden, Miele, & Morley, 2010). This *New Rural Paradigm* (Horlings & Marsden, 2012) is primarily propelled by urban demand, reterritorialisation of production, and a reaction to the logic of mass production. Products and services are endogenic, based on local and regional resources and tacit symbolic knowledge such as culture and identity. These may be agricultural products, rebranded as ecologically or culturally flavoured terroir products (Vecchio, 2010), renewable energy production (Marsden, 2009), or self-processed local fish products that fishers sell directly to customers (Salmi, 2009b). The growing experience industries and place branding are other examples of the transition towards postproductivism (Lorentzen & Jeannerat, 2012).

In this manner, rural communities are increasingly dependent on social and cultural values. In order to achieve an understanding of the vital aspects of rural contemporary societies, we argue that environmental management increasingly needs to apply methods from

the social sciences together with participatory features. One obstacle to hinder the implementation of such methods stems from the preference for quantitative methods. In this light, Sörlin (2013, p. 19) explains that numbers in environmental sciences have received a status as “social facts”: “Numbers helped establish issues and made them scientifically and socially acceptable, but they also privileged quantifiable science as the central knowledge base for the environmental.” Whitehouse (2015) concludes that environmental managers could learn from anthropological field methods, where it is presumed that different places have different characteristics and where it is the locals rather than scientists who possess the relevant knowledge of local circumstances. Sjölander-Lindqvist et al. (2015) similarly advocate social studies for improving trust, representation, communication, and leadership.

The case study in this article will deal with coastal and archipelago settings, places appealing to small-scale commercial fisheries, different forms of leisure and tourism, and places of residence and second homes. The number of commercial fishers has declined in Finland, and the remaining ones feel marginalised in the postproductivist setting, where coastal areas are viewed as places for nature conservation, as well as sources of individual experience (Salmi, 2015). Although local fish products are appreciated among consumers, the continuance of the coastal fishing livelihood is at stake, largely due to problems caused by protected animals, that is, seals and cormorants, on the one hand, and the lack of local involvement in the decisions made by the environmental managers on the other. The formal opportunities for mitigating the human-cormorant conflict are largely dependent on the functioning of the Finnish environmental management system.

4 | MATERIAL AND METHODS

The empirical data are gathered in the region of Ostrobothnia on the west coast of Finland in the Baltic Sea. It consists of, first, a questionnaire to the whole population of Swedish-speaking¹ professional fishers in the region ($N = 418$; 57% response rate). The questionnaire included 30 questions, both open-ended and closed-ended, inquiring about the experienced impact of cormorants and seals on fisheries in Ostrobothnia. The topics of the survey included various details on the presence and behaviour of cormorants and seals, the type of disturbances they cause, strategies to avoid disturbances, more general disturbances to the environment and the community, as well as opinions about the management of cormorants and future possibilities for fisheries in the region. The data are analysed using simple analyses of variance and sampling distribution. The questionnaire contributed with knowledge about cormorant presence and disturbances to fisheries. Fishers are at sea on an everyday basis and are consequently central informants regarding the whereabouts and habits of seals and cormorants.

Second, 13 semistructured interviews were directed at stakeholders in the Monå-Kantlax-Oravais-region, a small subregion in

Ostrobothnia where the oldest and largest cormorant colonies in Ostrobothnia are situated. By selecting a smaller area under heavy influence of cormorants, the aim was to achieve a depiction of local experience more broadly, reaching all types of stakeholders. The interviews were directed to fishers, second home owners, local fishing organisations, sailing and boat clubs, birdwatchers, land shareholders' associations, and the general local population. The interview guide consisted of questions regarding the respondent's relationship to nature, the behaviour of cormorants, experience on how cormorants affect the respondent's activities, and the community generally, as well as questions regarding the general debate and management of the species. Questions were somewhat adapted to every type of respondent; for instance, interviews with fishers naturally mainly concerned the impact on fisheries. Five of the interviews were directed at second home owners, only 600 m from a colony, in order to receive experience of living in the direct vicinity of the birds. Unfortunately, tourism entrepreneurs were not present in the studied region. All except one interview (phone interview due to practical reasons) were face-to-face interviews conducted on site. The interviews have been analysed using content analysis.

Third, the handling of the cormorant issue has been studied through four interviews with environmental management officials and legal documents and directives. These interviews inquired about the handling of the cormorant issue and derogation permit processes in the region, as well as each respondent's view on the cormorant management model in Finland and the EU. Three of the officials and four of the locals of the previously mentioned interviews participated in meetings during the derogation permit processes and thereby contributed also with experience of collaborative attempts. The interviews and documents are used to map out participation opportunities. Additionally, statistical data has been gathered from official databases. Because cormorants nest in large colonies and simultaneously hunt within a 20-km radius, it is expected that the respondents' experience of cormorants varies with distance from the colonies. The majority of the interviewees are situated in a direct or near direct vicinity to the colonies, and the fishers represent experiences in the whole region with a varying vicinity to the birds. By combining qualitative and quantitative methods, we are able to achieve a more holistic picture of stakeholder experiences. Qualitative methods are necessary for perceiving postproductivist activities, as well as for studying the experiences of management practices, whereas quantitative methods are more helpful for depicting the experiences of fisheries in a larger area.

5 | ENVIRONMENTAL MANAGEMENT—THE CASE OF FINLAND

Hansson-Forman et al. (2018) conclude that the Finnish governance mode, in contrast to its Scandinavian neighbours, is centralised, largely owing to the fact that goals and targets are decided nationally and subnational collaboration is set within top-down determined boundaries. Regional state organisations (ELY) are currently responsible for regional environmental management and supervision, for instance,

¹There are about 100 Finnish-speaking fishermen in Ostrobothnia, and these were excluded in order to avoid translation costs. There are no reasons to suspect significant differences between the language groups.

derogations regarding the cormorant. The Finnish Environment Institute (SYKE) provides the regional offices with data and assessments. Environmental departments at SYKE and ELY are subordinated to the Ministry of the Environment, whereas fisheries governance is subordinated to the Ministry of Agriculture and Forestry.

Accordingly, environmental management in Finland has been characterised by strong elements of hierarchy, scientific expertise, a high confidence in nature conservation, and state regulations (Sandström, Hovik, & Falleth, 2008). Participatory features have largely been channelled through corporative rather than representative channels, for instance, through forest and fishing organisations, and the local knowledge produced does not necessarily have any real influence on the issue at hand (Sandström et al., 2008). This is an indicative feature of the general government-governance debate, where advantages of direct participation are widely accepted, but where stakeholders find difficulties in penetrating the traditionally hierarchic politico-administrative system (Nordberg, 2017). Given that the environmental management system in Finland has been described as hierarchic and top-down functioning, the expectation for the case study is that participatory objectives such as trust building, empowerment, and learning are difficult to achieve.

In the process of producing management plans to conflict species, the input of professional scientific experts, especially biologists, has been central in many European countries (Pettersson, Salmi, & Parz-Gollner, 2012). On the basis of comparisons between management plans concerning cormorants, wolves, and seals in Sweden and Finland, Pettersson et al. (2012) detected a large variation in how different stakeholders had been involved. In a few cases, stakeholders were not involved at all, whereas in other cases, they were integrated into the process. In Finland, the processes regarding wolves and Baltic seals, managed by the Ministry of Agriculture and Forestry, have been more participatory and inspired by the social science approaches than the processes used in the case of cormorants. In addition, the wolf and seal management plans suggested more inclusive regional collaboration for mitigating conflicts than with the management plan for cormorants (Pettersson et al., 2012).

5.1 | Management of cormorants in Finland

Cormorants arrived in Finland in 1996, almost two decades after their initial recovery in Europe (Carss, 2003). The population growth has been rapid, exceeding 25,000 nesting couples and 120,000 individual birds in 2016 (Merimetsotyöryhmä, 2016; Finnish Environment Institute). The cormorant is a protected bird under Finnish legislation. Regarding derogations of the protection, Finnish legislation refers directly to the Birds Directive of the EU. Interpretation of derogations under the Birds Directive has been debated, especially regarding the definition of “serious damage” in Article 9. As such, the European Commission issued a specification in 2013 (European Commission, 2013). Here, “serious damage” is interpreted as inflicted on fisheries and related recreational interests and may have an effect “at the ecosystem, resource, individual or socio-economic level” (European Commission, 2013, p. 9).

A directive written by the Ministry of the Environment (YM1/5713/2010) has been fundamental to the cormorant management model applied in Finland within the period from 2010 to 2016. This directive interpreted “serious damage” as damage to *fishing waters* (not *fisheries* as named in the EU directive and instructions) and specifically stated that damage to second home owners or tourist businesses are not accounted for. “Problem areas” were defined by state level experts (Finnish Environment Institute) on the basis of information about territories where a sufficient amount of fishing with nets and cormorant feeding areas coincide. If applications for derogation permits involved areas outside these problem areas, assessments should be made through a joint discussion involving state regional authorities, nature conservation, and fishing authorities, with advice from national research institutes. Here, the applicant must present detailed evidence of a direct impact of cormorant predation on fishing stocks and fishing yields. This has been difficult to achieve, because calculations of direct impacts are often impossible to make (Salmi, Salmi, & Moilanen, 2010) and at the very least would require costly and lengthy research efforts.

In effect, there seems to be very little room for stakeholder participation, or any of the participation ideals, in this set-up. Cormorant management in Finland has been handled in a top-down fashion, with authority assessments involving mainly experts in biology deciding the boundaries of problem areas and the possibility of economic damage to fisheries. At the same time, postproductivist activities such as recreation have been excluded. Discontent with this set-up has been substantial, voiced by fishery organisations, second home owners, and archipelago residents. As a consequence, and also motivated by continuing cormorant population growth, a national cormorant working group (Merimetsotyöryhmä, 2016) agreed to the adoption of new measures for managing the human–cormorant conflicts, allowing elements of local involvement through the set-up of “regional cooperation groups.” Additionally, a new directive was written by the ministry, where disturbances to recreational activities are mentioned. The empirical evidence presented in this paper involves processes implemented under the previous directive.

About 2,400 commercial fishers operate along the Finnish coast (Salmi & Mellanoura, 2019). Fishing is small-scale, or artisanal, family-based entrepreneurship with historical ties to the local life mode and community traditions. In 2010, about one half of the interviewed coastal fishers reported cormorant problems (Salmi et al., 2010). Multiple damages were indicated and the respondents preferred wider opportunities for hunting the cormorants in order to mitigate the problem. The majority of fishers regarded grey seal induced losses as even more severe, although the effects of seals and cormorants cannot always be distinguished.

5.2 | Case study: Cormorants (and seals) in Ostrobothnia, Finland

The first cormorants settled in Ostrobothnia in the mid-2000s. Disturbances to fisheries and leisure activities were soon reported. Up until January 2015, six applications for derogation from protection were issued: Four were accepted by state regional authorities but were later

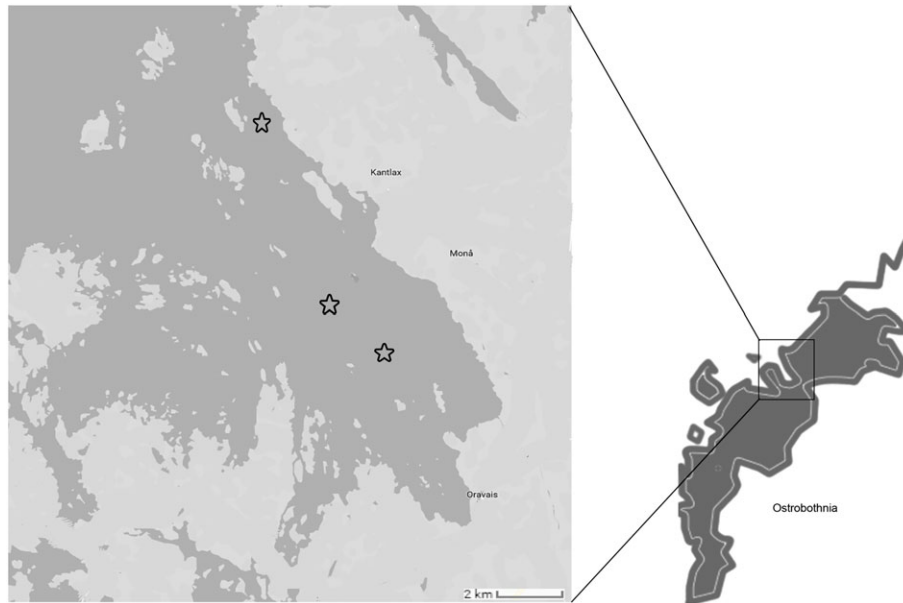


FIGURE 1 Map of Ostrobothnia and the Monå-Kantlax-Oravais region. Stars indicate main cormorant colonies in the area

rejected by the Supreme Administrative Court. The applications consisted of estimates of local fishers' economic losses, which, according to the court, did not meet the high demands of scientific evidence. As the following description demonstrates, the crucial circumstances of the fishers and the disturbance of other activities in the archipelago were neglected as a basis for decisions. The case study region was located outside of the "problem areas" selected by the ministry, which in effect demanded evidence of damage on "fishing waters." We will in the following look at postproductivist activities in the region, as well as the experiences of the cormorants and the conflict by different actors.

5.3 | The region and postproductivist activities

The case study site is part of the Ostrobothnia region with a 300-km coastline and a population of 180,000. Fishery has historically been of large importance for the subsistence of the region, but its economic importance has declined along with modernisation. Still, almost 30% of active fishers in Finland are located in Ostrobothnia (Source: Natural Resources Institute Finland). The Monå-Kantlax-Oravais case study area may be characterised as a rural archipelago, with 1,930 inhabitants and a share of primary production still well over 10% (see Figure 1).

However, there are 1,192 second homes in the region (six second homes per 10 permanent inhabitants), and commuting has tripled from 10% to 30% during the last 30 years (Source: Statistics Finland). There are still five active professional fishers, but fishing is largely a recreational activity. Regarding economic activity, this development is typical for rural areas and implies that coastal regions in Ostrobothnia may primarily be characterised as places of residence, leisure, and nature conservation, with shrinking weight on primary production. The importance of commercial fishing, however, extends to local identity and culture.

It is not possible to numerically estimate the benefits of postproductivist activities on a national level, nor on a regional or local level. However, recent studies suggest that these benefits are substantial,

especially in local communities where second homes are abundant (Mökkibarometri, 2016; Adamiak et al., 2015).² Second home residents bring with them competences and networks that benefit the local communities (Czarnecki & Sireni, 2018). Social, cultural, and health benefits of spending time in nature (Barton, Bragg, Wood, & Pretty, 2016) and of recreational fishing (Eskelinen & Seppänen, 2014) are also indicated in the literature, with related economic benefits largely unknown. In Finland, the share of second homes and the share of recreational fishing in relation to population size are among the highest in the world (Adamiak et al., 2015; Varjopuro & Salmi, 2003). Because the proportion of second homes is very high in the case region, as well as related recreational fishing, the reasons for taking these activities into account in management decisions are well justified. These knowledge economy features are likely to be important parts of the socioecological system in the region. Although the relationship has changed during the previous decades, the interplay between nature and humans has still developed over centuries, forming special relationships between humans and animal and plant species. A participatory stance to environmental management would consequently aim at achieving understanding of this relationship, for instance, what features of nature are appreciated and how and the manner in which people care for nature. Another long-term objective would be to build trust, which may be exploited if environmental protection efforts are needed in the future.

5.4 | Fisheries

The questionnaire survey reveals that cormorant-fisheries conflicts are widespread in Ostrobothnia, with around 80% of commercial fishers indicating that cormorants affect their fishing activities. The scientific debate in Finland has focused on the cormorants' effect on fish stocks, and consequently, a large number of studies have looked

²Second homes are calculated to bring 60,000 jobs and a turnover of 6.2 billion euros annually in Finland (Mökkibarometri, 2016).

at this issue, with varying results (e.g., Lehtikoinen, Heikinheimo, & Lappalainen, 2011; Troynikov et al., 2013; Östman, Boström, Bergström, Andersson, & Lunneryd, 2013; Mustamäki, Bergström, Ådjers, Sevastik, & Mattila, 2013; Heikinheimo, Rusanen, & Korhonen, 2016; Salmi, 2015). At the same time, the problems that the fishers encounter stem from cormorant-induced damage to landed fish, fishing gear, and the altered behaviour of the fish. The fishers depict how the cormorants hunt in big flocks and scare fish away from large areas for weeks to follow. As many as 94% of the fishers indicating that cormorants affect their fishing activities see the scaring away of fish stocks as a difficulty. Because the commercial fishers have access only to designated fishing areas, they may find themselves without fish to catch. Both seals and cormorants are reported to damage the catch when it is still in the gear. In order to avoid this, the fishers visit the fishing gear more often, fish for shorter time periods, attempt to scare the predators away, and even fish at night. These strategic responses are time consuming, costly, and cumbersome activities. As a consequence of the animal-related problems, together with other challenges faced by the coastal fishers (Salmi, 2015), the precariousness and unpredictability of the profession has increased. In questions about future prospects, the most popular alternative (chosen by 36% of respondents) was that fishery is no longer an attractive occupation—fishers consider quitting as a consequence of cormorants and seals. All these difficulties experienced by the fishers are neglected if management decisions are based on only biological investigations. This knowledge may not be accessed by anything else than direct contact with the fishers, through interviews, surveys, direct discussions, and group meetings. There is an obvious interplay between the fishers and natural features, such as the changing behaviour of fish, of seals and of cormorants, which indicates a need of combining biological and social scientific studies. The experience of fishermen may also guide biological investigations. These are all features of a participatory process, as described above.

When judging economic losses, seals are assessed as being the larger culprits. Yet, when the two species are combined, the judgement of economic losses rises steeply. Respondents indicating the impact of only seals assess the economic loss of their total income to be 22%, whereas those affected by both cormorants and seals judge the loss to be 38%.³ The questionnaire survey, as well as interviews with fishers, indicates that the combination of the two species in practice locks out any possibilities for finding new fishing strategies in order to adapt to the situation. To avoid seals, fishers have replaced former fishing for whitefish with targeting perch in shallower waters. After the entry of cormorants, this possibility has diminished, because cormorants hunt in shallow waters as well. The unresponsiveness of authorities to the fishers' problems has reduced confidence: 93% of respondents indicate having no confidence in the authorities regarding the handling of cormorants. Lack of trust is an indication of an absence of early inclusion and empowering elements of a participatory process. In the absence of social scientific analyses and participatory governance arrangements, environmental authorities seem to have

difficulties in perceiving fishers' experiences and positions with regard to the cormorants and seals, which indicates a lack of learning—an important element of the environmental management process.

5.5 | Local experience

The direct cormorant-induced disturbances described by locals—others than commercial fishers—and part-time dwellers in the Monå-Kantlax-Oravais region deal primarily with subsistence and recreational fishing and water quality. Because cormorants scare fish away, second home owners near the cormorant colonies complain about the lack of fishing possibilities, which is an important part of cabin culture in the area. Swimming is a common activity in the summer, and second home owners nearby the colonies point out the disgust felt by odour and dirt in the water. At the same time, environmental officials describe how the water quality has been monitored by investigating levels of bacteria and nutrition, concluding that no significant changes are visible. These investigations are regarded as misguided by the locals, a circumstance that would have been alleviated with a better integration of knowledge systems, as described in the participatory management literature. One interviewee describes the presence of the white islets covered in cormorant faeces as depressing, because “you see them all the time, you can't put blinkers on.” These disturbances are strongest and most visible near the colonies, but interviewees indicate that especially fishing possibilities are affected in a larger area.

The locals maintain that life in the archipelago has faded partly as a result of diminished recreational fishing and fisheries management activities. Local fishing water shareholders' associations have cared for local fish populations, issued time limits, stocked fish fingerlings, and provided spawning places for fish. All these activities have stopped due to the presence of the cormorants. One interviewee points out that “it is a part of our identity, this beautiful archipelago,” indicating that the cormorants, together with the indifference displayed by the authorities, are regarded as an attack on a way of life. Eleven of the 13 interviewees believe the cormorant issue to be affecting the community negatively. One respondent pointed out that the whole issue is “mentally degrading ... many people feel mentally ill.”

The conduct of the authorities in the matter, as experienced through the media or by direct involvement in derogation applications, became a dominating theme in nearly all the interviews. One interviewee even claimed that “the cormorant is only one half of the problem, the indifference of the authorities is the other.” Distrust towards the environmental authorities has increased due to certain public statements by scientists and government officials, such as the claim that cormorants only eat fish species and sizes not targeted by commercial fisheries, when fishermen and locals have been able to disprove such a claim by their own experience. Thereby, the competence of the authorities is questioned, as well as the honesty and the good intention of civil servants. One interviewee even feels that civil servants “seem to be very fond of their position of power and the ability to decide over people.” Thus, locals clearly indicate that their postproductivist activities suffer

³Statistically significant difference: ANOVA, $p < 0.013$.

from the presence of cormorants. The management tools used by the environmental authorities seem to spark hostility among locals rather than alleviate conflicts. The management system has not succeeded in understanding, or even attempted to understand, individual and collective responses to the cormorants. When we confronted locals for the interviews, a few of them expressed gratitude for finally being able to express their concerns regarding the cormorant, because they experienced that their kind of disturbances were not noted in the public debate nor in management decisions. A need for direct discussions and deliberation was thus clearly felt by the locals in the area. Such willingness to express their point of view must be benefitted from in order to be able to fulfil participatory ideals such as mutual learning, empowerment, trust building, and problem solving, especially regarding alterations in socioecological system such as when new species arrive.

5.6 | Derogation permit processes

The derogation permit processes in the area were largely handled formally, by locals preparing and handing in applications and environmental management officials processing them and making the decisions. However, after a few years of this procedure, management officials saw a need for closer engagement with stakeholders. Consequently, meetings gathering representatives of stakeholder groups were arranged. The environmental officials regarded the meetings as beneficial: “the authorities received a face [to stakeholders], while we found groups that could tell us what this was all about, what feelings they have.” Another official was of the opinion that “the discussion quality improved a lot ... I experienced that in the end we were able to discuss issues truthfully.” The experience of local stakeholders was, however, the opposite. One stakeholder felt that “we didn't get anywhere ... the biggest problem was that the authorities were totally dismissive ... of actions.”

At the time of the stakeholder meetings, the authorities considered that their hands were bound by court decisions. Consequently, the meetings were insignificant for the derogation permit process itself. In this manner, socio-economic factors never received actual applicability. The statements of the officials do point to learning benefits of the participatory features but only towards the officials. This supports the proposition that participation must be allowed early on when options are available and the participation process still can receive relevance. If otherwise, as in this case, there is a risk that the participation process will even aggravate the conflict.

5.7 | Are participatory ideals fulfilled?

Four applications for derogation from protection were issued in the Monã-Kantlax-Oravais area during the studied time period. Every application was accompanied by advising efforts of state regional officials, often as feedback to applicants requesting necessary additions. This was partly done by direct communication, which one official described as far exceeding administrative responsibilities. Stakeholder meetings were arranged, similarly exceeding requirements. Accordingly, the

visible participative features were case specific, whereas formal participatory requirements were non-existent in the management model at the time.

The visited case displays how participatory features are difficult to implement with satisfying results in a top-down functioning system. When locals and fishers finally received the opportunity to present their views, there were no longer any real opportunities for influencing how the growing cormorant population should be handled. The process did result in learning among the officials but not the other way around, and there were no official feedback channels for the achieved knowledge to be assimilated into the management system. There were, as described above, evidence of a lack of integration of knowledge systems in several instances where this would have been beneficial. One environmental official admitted that an imbalance of ecological and social knowledge existed: “What was missing was that we do not perform socioeconomic assessments ... we only do biological assessments in accordance with the Birds Directive ... it gleams through that this is missing.” Similarly, another official highlighted the possibility of cormorant disturbance on recreational activities, which “may be of great importance economically and socially,” and that assessing such disturbance “could surely be done in a better manner,” but “Finnish legislation does not permit us.” Consequently, none of the four categories of participatory ideals were met. There were no real power sharing or empowerment of citizens raising the legitimacy of decisions, trust building was unsuccessful, there was very little movement towards integrating knowledge systems, and there was very little social learning and problem solving.

6 | DISCUSSION

In this article, we have presented implications of rapidly increased cormorant populations, and the related environmental management system, affecting coastal rural communities. In the studied case, we have detected a gap between the participatory ideals of environmental management and the local reality in the affected region. The case demonstrates how narrow (biological) scientific questions and top-down management are unable to perceive and handle disturbances to two major activities in the cormorant habitat: (a) science and management focus on dependencies between cormorant predation and the state of fish stocks, although fishers are primarily struggling with the combination of seal and cormorant disturbances and changing fish behaviour and (b) science and management investigate the level of bacteria or nutrients in the water, although second home owners are concerned with visible dirt in the water, odour, and reduced recreational fishing possibilities close to the colonies. Fishers and second home owners are particularly disturbed by what is comprehended as an indifferent attitude by the authorities. Moreover, the division of the governance system into two sectors—the natural resource and environmentally oriented ones with their distinctive value systems—complicates understanding of the fishers' challenges and the need for participatory processes.

The knowledge society, as described above, is complex with social and cultural aspects receiving increasing importance for socio-

economic circumstances. The same goes for rural areas, where social and cultural aspects receive importance in complex relationships with traditional primary production. These are circumstances that environmental management needs to pay attention to in order to be able to construct equitable participatory processes and make legitimate decisions. Considering the characteristics of the knowledge society, combining social and ecological knowledge is increasingly important in order to reach this understanding. Biological investigations have accompanied the arrival of the cormorant in Finland, whereas social analyses have been rare. We argue that societies and local communities are increasingly dependent on factors such as trust, cohesion, confidence in future possibilities, and generally a well-thriving social and natural environment. The studied case displays that also finding the relevant biological research questions would have benefitted from social analyses, because, for example, changing fish behaviour would have been of relevance alongside analyses of cormorant diets and fish stock sizes. Due to the increasing complexity of social-ecological interactions in the postproductivist coastal setting, learning about the impact of new species, and finding solutions, demands considerable social analyses and participatory features initially and throughout the learning process.

In the studied Finnish cormorant derogation permit processes, statements without scientific data supporting them are regarded as mere opinions by the decision makers. Sufficient scientific evidence is difficult—often impossible—to attain. As a consequence, participants easily question the relevance of participation processes altogether. There is a need to separate the participation of stakeholders from social analyses. The former offers possibilities for becoming aware of new concerns and for comprehending the other side's perspective. This should be regarded as a tool for achieving understanding, building trust, and in the end, reaching legitimacy for decisions. The latter should, on the other hand, be regarded as a tool for describing and analysing socio-economic circumstances and making social-ecological interdependencies visible, as well as for preparing and designing participatory ventures in accordance with the character of stakeholders and in order to achieve appropriate representation (Sjölander-Lindqvist et al., 2015). Sjölander-Lindqvist et al. (2015, p. 182) point out the importance of *facilitative leadership*, where leaders “assume the role of an honest and prejudiced broker,” including “capacity building of individuals and stakeholder groups.” In other words, one should not expect local stakeholders to be able to describe and present evidence of complex socio-economic factors. It may also be difficult for administrators, often trained in biological sciences, to understand the complex relationships between socio-economic and ecological factors. One small step for overcoming this obstacle may be Cornell et al.'s (2013) argument for officials with “T-shaped skills,” in other words, officials possessing a broad interdisciplinary knowledge base with one area of expertise, rather than merely ecological expertise.

Participatory ideals such as empowerment, learning, and problem solving demands that stakeholders not only receive the opportunity for stating their views but also that their views are taken seriously. One suggestion how this could be achieved is to set-up a scheme where these statements are by rule used to guide social analyses and

biological research efforts at an early stage. Participatory features in environmental management may in this manner form a tool for detecting alterations in nature and their impact on local livelihoods and communities, and thereby be a guide for integrating knowledge systems. If these activities are launched early on when a new species arrive, there might still be opportunity for building trust and a wide knowledge base, which may later ease conflict mitigation efforts.

Hansson-Forman et al. (2018) conclude that national policymakers find themselves in a difficult situation, because international regulation urges for participation at the same time as it also constrains national processes and outcomes. The depiction by regional officials in the visited case suggests that the same goes also for the regional level versus the national level. Collaborative arrangements move towards irrelevance if the knowledge produced is not used as feedback to higher levels of government. The presented case study demonstrated that a top-down functioning system such as the Finnish one leaves little room for participatory features with relevance. The character of multilevel governance, especially visible in the case of an EU country, further complicates participatory features in cases where the capacity of each level of government in the environmental management system is not clearly defined. As we have suggested, there must be a certain degree of authority also on the local and regional level for the participatory ideals to be met, for instance, by introducing strong vertical feedback mechanisms and negotiation possibilities. Therefore, when a supranational authority such as the EU demands participatory features in environmental management to be enacted by the member states, such a demand should be accompanied with suggestions for authorisation of such features.

Scholars have discussed the path dependency of state systems, where leading actors form structures and constrains, which act as selection mechanisms and which in turn may either approve or deny suggestions for change (Jessop, 2008). The prevailing politico-administrative system is by nature hierarchic, and participatory features have been induced on top of this system (Bäcklund & Mäntyselä 2011). Introducing feedback mechanisms with relevance implies leading actors emitting power. When looking for the reason to the gap between participatory ideals and actual environmental management, the path dependency of this system is important to understand. Merely advocating participatory features is apparently not enough. In order to implement such features, states must also consider the manner in which the whole governance system is constructed, both regarding the microlevel (the role of civil servants) and the macrolevel (power balance between administrative levels).

7 | CONCLUSIONS

Stakeholder participation is generally advocated, but the scientific literature questions the ability of deliberative discussions, per se, to overcome antagonism in environmental conflicts. Deliberative discussions need to reach relevance, which entails that issues such as power structures and knowledge spheres must also be confronted. We argue that a necessary step forward is to level out the imbalance between social and ecological sciences in such processes: socio-economic

assessments should always accompany ecological analyses. This is essential for the central ideals of deliberative theory, such as discussion quality, because an imbalance of scientific data between adversaries may very well contribute to an aggravated conflict. Social science may also help design participation processes according to the specific needs of the issue at hand. However, even though participatory features would hypothetically be able to fulfil the ideals, the knowledge of local circumstances needs to be negotiated also vertically. Otherwise, supranational and national legislation and directives might make these agreements irrelevant and pull the rug from future attempts to engage stakeholders.

In order to bridge the gap between participatory ideals and the reality of environmental governance, we conclude that there is a need for reinforcing (a) social scientific approaches; (b) vertical negotiations at the local, national, and supranational level; and (c) the training of civil servants as facilitators of communication. In the visited case, environmental management lacked the tools and directives for paying sufficient attention to recreational activities and to the troubles experienced by commercial fishers. These local activities are dependent on factors that easily escape biological assessments, and are, at the same time, central to the viability of contemporary rural societies.

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