

Nordisk Miljörättslig Tidskrift



Nordic Environmental Law Journal

2017:1

www.nordiskmiljoratt.se

Nordisk Miljörättslig Tidskrift/Nordic Environmental Law Journal 2017:1

ISSN: 2000-4273

Redaktör och ansvarig utgivare/Editor and publisher: Gabriel Michanek

Webpage <http://www.nordiskmiljoratt.se/omtidskriften.asp> (which also includes writing instructions).

Regulating Antifouling Paints for Leisure Boats – A Patchwork of Rules Across Three Baltic Sea Countries

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Abstract

This article analyses how the use of antifouling paints for leisure boats is regulated in Denmark, Finland and Sweden. All three countries appear to apply a somewhat fragmented approach to the different matters related to antifouling paints, including environmental quality (e.g. water quality), chemical products (e.g. authorisations or restrictions) and waste handling. The legislation related to antifouling paints and practices addresses a range of different actors and has varying legal implications on different regulatory levels. The most central actor as to the contamination by antifouling substances is the boat owner using antifouling paints and the context in which this activity normally occurs, i.e. the leisure boat marina or boat club. In the three jurisdictions analysed, environmental quality regulation appears unable to directly oblige either the boat owner or the marina to take sufficient measures and conduct. Environmental protection regulation, including waste legislation, generally excludes smaller leisure boat marinas and boat clubs from permitting and waste management requirements. In product regulation, the authorisation and/or restriction rules of antifouling paints (biocides) function as sort of an ‘advance supervision’ of chemical safety requirements, e.g. based on leaching rates. But when it comes to actual application of paint on the boat hull, compliance with product instructions/limitations is generally not supervised – presumably due to a lack of resources. Furthermore, environmental requirements for the maintenance of boats are often based on local regulations. From a perspective of compliance and enforcement, further direct regulation of ma-

rinars and boat owners on the basis of general environmental protection law, may not constitute the ‘silver bullet’ to sufficient environmental protection. Another option could be to encourage private law arrangements and “self-enforcement” by e.g. the marinas or boat owner associations.¹

¹ This work resulted from the BONUS CHANGE project and was supported by BONUS (Art 185), funded jointly by the EU and national funding institutions, including Innovation Fund Denmark, the Finnish Academy and the Swedish Environmental Protection Agency. Within the project three national reports of the national legal framework have been elaborated as well as a report on the EU legal framework. The reports are available at: <http://changeantifouling.com/read-more/scientific-articles/> and <http://law.handels.gu.se/forskning/skriftserien>.

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1. Introduction

The Baltic Sea is one of the largest brackish water environments in the world and is a particularly sensitive environment, for example, due to the slow water exchange with the North Sea and a water retention time of approximately 25 years.² The Baltic Sea is also a popular area for recreational boating and it is estimated that it is used by some 3.5 million leisure boats.³ Most of these leisure boats use toxic antifouling paints to avoid or reduce the colonization and subsequent growth of sessile organisms on the boat hulls (biofouling). The toxic substances are released to the environment from the boats at berth and during sailing, but also when cleaning and maintaining (scraping) the boat hulls. These activities cause a diffuse pollution load, which, in accumulation, leads to contamination of coastal waters as well as of soil and sediments. This demonstrates that regulation of antifouling paints and its associated activities is a multifaceted matter addressing different activities and actors, including boat owners, marinas and harbours. The use of antifouling paints in sensitive marine environments has been heavily debated for decades in the Baltic countries. In particular, the discussions on the use of highly toxic tributyltin (TBT) paints in the late 1980s led to an EU prohibition on the marketing and use of TBT for small boats (less than 25 metres) in 1989⁴ and for

all vessels in 2002.⁵ The TBT-based paints were mainly replaced by copper-based or zinc-based paints, which also are harmful to the marine environment. Such paints may be subject to various restrictions at national level, although they are in principle governed by the EU Regulation on Biocidal Products,⁶ which is yet to come fully into operation when the transitional rules expire. The Biocidal Product Regulation addresses the placing on the market of antifouling paints as well as the use of such products. In addition to product regulation, the practices of boat owners and marinas in relation to antifouling paints or alternative measures, as well as the effect of such pollution are regulated by both the EU and the Member States. This is also the case as regards the management of contaminated soils and sediments, which is another important issue.

This article aims to analyse how the use of antifouling paints for leisure boats is regulated in Denmark, Finland and Sweden. While the three countries share some regulatory similarities, e.g. as EU Member States, they also represent different standpoints as regards both antifouling paints and leisure boating. In comparison with

tive provisions of the member states relating to restrictions on the marketing and use of certain dangerous substances and preparations.

⁵ Commission Directive 2002/62/EC of 9 July 2002 adapting to technical progress for the ninth time Annex I to Council Directive 76/769/EEC on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations (organostannic compounds). The Commission Directive was adopted as a follow-up to the International Convention on the Control of Harmful Anti-fouling Systems (AFS Convention). The ban of the AFS Convention on application the application and bearing of organotin compounds on ships was subsequently implemented by Regulation (EC) No 782/2003 of the European Parliament and of the Council of 14 April 2003 on the prohibition of organotin compounds on ships, OJ L 115, 9.5.2003.

⁶ Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products, OJ L 167, 27.6.2012.

² In 2005 the Baltic Sea was designated as a particularly sensitive sea area by the International Maritime Organisation (IMO), see <http://www.imo.org/en/OurWork/Environment/PSSAs/Pages/Default.aspx>. For further information on the sensitivity of the Baltic Sea, see Magnusson, K. & Norén, K. (2012), The sensitivity of the Baltic Sea ecosystems to hazardous compounds. BaltSens Project. Swedish Chemicals Agency. PM 9/12.

³ Baltic LINes (2016): Shipping in the Baltic Sea – Past, present and future developments relevant for Maritime Spatial Planning. Project Report I., p 22.

⁴ Council Directive 89/677/EEC of 21 December 1989 amending for the eighth time Directive 76/769/EEC on the approximation of the laws, regulations and administra-

Denmark, leisure boating is a much bigger activity in Sweden and Finland,⁷ where it is perhaps even part of the national identity or culture. It also appears that antifouling and its environmental consequences is a fairly politically hot issue in Sweden,⁸ whereas this is not so much the case in Finland and Denmark. Thus, it is likely that these differences influence the regulatory approaches and instruments in the three countries.

In all three countries, the above sketched background, is reflected in scattered and piecemeal legislation with normative implications in a range of different legal areas, involving both public and private law. Although the EU lays down a fairly comprehensive legal framework as regards chemical products and environmental quality, there is wide room for national regulatory approaches when it comes to regulating, or not regulating, the practices of boat owners and marinas; for example, whether to use strict rules (combined with supervision and enforcement) or to use more informative or voluntary measures.

The article first outlines the relevant governance structures in the three countries. The article then turns to the different regulatory perspectives starting off with the environmental quality regulation which is strongly embedded in EU legislation. Next step is to look into the regulation of the marketing and use of antifouling paint as a biocidal product, i.e. product regulation, which is also heavily influenced by the EU. The article thereafter analyses how antifouling practices of boat owners and marinas are regulated in the three countries, including also the linkages

between public and private regulation as well as soft law mechanisms such as information strategies. Finally, the article seeks to identify similarities and differences between the countries and discuss regulatory challenges and options for addressing antifouling concerns. The article does not analyse ownership issues related to marine waters and the seabed, which may influence regulatory options. In general, there is no private ownership for marine waters and seabed in Denmark, whereas this is to some extent the case in Sweden and Finland.⁹

2. Governance structures

This section aims to capture the structural character of the national legal frameworks and the distribution of powers among different authorities related to antifouling of leisure boats. Antifouling issues cut across several pieces of legislation, areas of law and different authorities. This is illustrated by different regulatory approaches regarding matters such as marketing, use and handling of antifouling products. EU and international law is one of the constituents of the regulatory landscape, which can be characterized as fragmented being both multi-layered and cross-sectoral.

2.1 Legal framework

An important point is to what extent the legal framework and the institutional arrangements reflect an integrated approach and whether this has any implications as regards the regulation of antifouling issues. The general legal framework which sets out the governance principles for en-

⁷ HELCOM. 2010. Baltic Sea Environment Proceedings No. 123. Maritime Activities in the Baltic Sea An integrated thematic assessment on maritime activities and response to pollution at sea in the Baltic Sea region, p.15.

⁸ There has been a number of different campaigns by e.g. Swedish Society for Nature Conservation <http://www.naturskyddsforeningen.se/vad-vi-gor/hav/ren-batbotten> and public debates, such as Syrén, M. Åsa Romson målar med förbjuden färg. Expressen. 2014-10-06.

⁹ In Finland, coastal and inland water bodies are in private, non-shared ownership. These areas were reserved for common use of adjacent landowners. These areas are technically owned by partition units and managed jointly by the individual owners. Due to post-glacial rebound these water areas can also contain some land-areas by the coastline.

vironmental regulation in the three countries are somewhat different; while Denmark and Finland display a sectoral approach, it appears that Sweden leans towards a more integrated legislative approach.

The Finnish Environmental Protection Act (527/2014)¹⁰ lays down the main principles for environmental protection. Marine environmental issues, chemicals, waste and environmental (water) quality matters are regulated by separate acts.¹¹ The Danish Environmental Protection Act (1189/2016)¹² deals with pollution issues in general, including waste, in addition to sectoral legislation such as the Marine Environmental Protection Act (1216/2016)¹³ and the Chemicals Act (849/2014).¹⁴ Environmental issues are in Denmark also addressed by other sectoral legislation such as maritime legislation, e.g. the Harbour Act (457/2012)¹⁵ according to which harbour regulations may address the handling of antifouling paints. The Swedish Environmental Code (1998:808)¹⁶ is an overarching law applicable to all types of activities and measures. Except for its general rules of conducts, the Code includes specific chapters with provisions on e.g. remediation of contaminated land and water, chemicals and wastes. Although this seems as an integrated legal approach, separate decrees and ordinances issued on the basis of the Code regulate separately the different themes governed by the Environ-

mental Code. These lower level more detailed acts thus share a common legal foundation, but are nonetheless separately regulated.

The picture that emerges is that despite an overarching regulatory framework, the general legal approach is characterised by separate regulation of products, polluting activities and environmental quality; either in higher level acts such as in Finland and Denmark, or by means of decrees and ordinances in Sweden.

2.2 Authorities and other organisations

In all three countries, the legal framework is based on public law where relevant authorities are assigned with (a varying degree of) administrative, supervisory and enforcement powers. Thus, a multitude of authorities are involved in the administration and enforcement of the relevant legislation. Powers are distributed not only among sectoral authorities at national level, but also between different levels of authority at national, regional and local level. The Swedish Chemical Agency, the Environmental Protection Agency, and the Agency for Marine and Water Management all have important functions and may address antifouling issues in different ways. A somewhat similar situation exists in Denmark where the Environmental Protection Agency and the Agency for Water and Nature are the most important national authorities, both as part of the Ministry for Environment and Food.¹⁷ However, the Ministry of Transport and Buildings has powers as regards harbours and maritime issues. In Finland the Finnish Safety and Chemicals Agency (TUKES), the municipalities, the regional ELY-Centers,¹⁸ regional state administrative agencies as well as the Ministry of the Environment and

¹⁰ Ympäristönsuojelulaki (527/2014).

¹¹ Merensuojelulaki (1994/1415), Merenkulun ympäristönsuojelulaki (1672/2009); Kemikaalilaki (599/2013); Jätelaki (646/2011); Laki vesienhoidon ja merenhoidon järjestämisestä (1299/2004), Valtioneuvoston asetus vesienhoidon järjestämisestä (1040/2006).

¹² Consolidated Act 1189/2016 (bekendtgørelse af lov om miljøbeskyttelse).

¹³ Consolidated Act 1216/2016 (bekendtgørelse af lov om beskyttelse af havmiljøet).

¹⁴ Consolidated Act 849/2014 (bekendtgørelse af lov om kemikalier).

¹⁵ Consolidated Act 457/2012 (bekendtgørelse af lov om havne).

¹⁶ Miljöbalk (1998:808).

¹⁷ As of February 2017 the Environmental Protection Agency and the Agency for Water and Nature were merged into one Environmental Protection Agency.

¹⁸ Centre for Economic Development, Transport and the Environment.

the Environment Institute, all have tasks related to antifouling paints.

Private law arrangements and actors may also be relevant. For example, civil associations (e.g. boat owner or marina associations) or private entities (e.g. harbours/marinas) may play a significant role in particular as regards the practices of boat owners and marinas in the use and handling of antifouling products and waste. Examples include the Danish Association of Yachtsmen and the Association of Marinas, who actively supported an information campaign in 2003/2004 and cooperated with the Environmental Protection Agency on a 2003 Action Plan. In Finland the non-profit organisation Keep the Archipelago Tidy¹⁹ has introduced a so-called 'Roope Harbor Programme' which promotes, inter alia, environmentally friendly practices in marinas and among boat owners through information sharing on hazardous paints and their impacts and promotion of alternative boat maintenance methods. In Sweden, the Swedish Yachting Association,²⁰ together with the Swedish Society for Nature Conservation²¹ and other associated organisations, spread information in an effort to reduce the use of toxic biocidal antifouling paints.²² Furthermore, civil associations and companies (i.e. marinas) may, as mentioned above, establish their own regulations or codes of conduct based on private law arrangements, including their own methods of sanctioning non-compliance, e.g. by excluding boat owners from membership. Nevertheless, such sanctions must be in line with principles of association law and company law.

¹⁹ Keep the Archipelago Tidy (Fi: *Pidä Saaristo Siistinä*): http://www.pidasaaristosiiistina.fi/in_english.

²⁰ Svenska Båtunionen: <http://batunionen.se/>.

²¹ Naturskyddsföreningen: <http://www.naturskyddsforeningen.se/>.

²² <https://greenantifouling.wordpress.com/2015/02/16/naturskyddsforeningen-propagerar-for-giftfria-alternativ-till-bottenfarg/>.

3. Regulating antifouling paints

In this section, different regulatory perspectives relevant to antifouling paints are analysed. Firstly we will look into environmental quality regulation and the extent to which antifouling paints (and residues) are considered a problem from an environmental quality point of view, in particular addressing the regulation of water quality.²³ Secondly, the regulation of the products, e.g. authorisation, marketing and possible restrictions on use of antifouling paints, will be examined. Thirdly, the regulation of potentially harmful or polluting activities of e.g. the boat owners and marinas when handling antifouling paints including waste management regulation will be addressed. The management of soils or sediments contaminated by toxic antifouling paints or residues will be addressed as a separate area of regulation, while finally some general remarks will be made as regards supervision and enforcement.

3.1 Environmental Quality Regulation

The extent to which antifouling paints are addressed in the regulation and management of the quality of the aquatic environment varies in the three countries. The EU Marine Strategy Framework Directive (MSFD)²⁴ and the Water Framework Directive (WFD)²⁵ set up a framework for Marine Strategies and River Basin Management Plans (RBMPs) to protect waters and the aquatic

²³ Biodiversity and nature protection legislation, e.g. the EU Habitats Directive, could also be relevant in relation to antifouling paints and specific protection rules may apply to e.g. Natura 2000 areas. This is, however, not analysed in this article.

²⁴ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 327, 22.12.2000.

²⁵ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy, OJ L 164, 25.6.2008.

environment in the EU Member States. In order to achieve the environmental objectives of the directives, Member States are obliged take adequate measures.

Antifouling issues belong to the geographical coverage of both the RBMPs and the Marine Strategies, as they generally encompass the coastal waters of a Member State.²⁶ However, the dividing line is not clear and the main responsibilities as regards Marine Strategies and RBMPs, respectively, may not necessarily lie with the same authority or within the same piece of legislation in the three countries. In Finland, the Water Management Act (1299/2004)²⁷ and its related decrees²⁸ implement the WFD as well as the MSFD, but as for the authorities, the regional ELY-centers play an important role as regards the RBMPs, whereas the main responsibility as regards establishing the Marine Strategy lies with the Ministry of Environment and the ELY-centres are responsible for its implementation. In Denmark, on the other hand, the implementation of the Directives has been made by separate legislation for the WFD by the Act on River Basin Planning (1606/2013),²⁹ and for the MSFD by the Act on Marine Strategy (1203/2016),³⁰ but the Agency for Water and Nature (now Environmental Protection Agency) is the responsible authority for

both the Marine Strategy and the RBMPs. The Swedish Environmental Code generally implements both the WFD and MSFD but specific rules are found in ordinances and decrees. Five regional water authorities are responsible for the implementation of the WFD, while the Swedish Agency for Marine and Water Management is responsible for the implementation of the MSFD.

3.1.1 Environmental Objectives and the Priority Substances

Under Article 5 of the WFD, Member States must divide their national waters into ‘water bodies’, and every six years, evaluate and classify them according to their environmental status.³¹ The overall environmental objective of the Directive is ‘good status’ by December 2015³² which includes both the chemical and ecological status of each water body. Consequently, the status of a water body is defined by the poorer of its ecological status and chemical status, which are determined against a classification system containing five status classes for ecological status (bad, poor, moderate, good, high) and two classes for chemical status (poor and good). In other words, both ecological status and chemical status must be good for a water body to fulfill the environmental objective ‘good status’.

The classification of chemical status of water bodies is carried out in each country through assessing the concentrations in water bodies of so-called ‘Priority Substances’ and ‘Hazardous

²⁶ In general, the WFD applies to an area up to 1 nautical mile from the baseline, while the MSFD concerns the seaward side of the baseline of the territorial waters within the jurisdiction of any Member State as defined by United Nations Convention on the Law of the Sea of 10 December 1982 (UNCLOS). Marine strategies may, however, also address issues within the 1 nautical mile from the coast as is the case in all three countries.

²⁷ Laki vesien- ja merenhoidon järjestämisestä (1299/2004).

²⁸ Valtioneuvoston asetus merenhoidon järjestämisestä (980/2011), Valtioneuvoston asetus vesienhoidon järjestämisestä (1040/2006), Valtioneuvoston asetus vesienhoitoalueista (1303/2004).

²⁹ Lov om vandplanlægning (1606/2013).

³⁰ Bekendtgørelse af lov om havstrategi (Consolidated Act 1203/2016).

³¹ Thereafter the main pressures on the water bodies are identified, followed by the adoption of environmental quality objectives and Programmes of Measures (PoMs), with the purpose to achieve those objectives with respect to each water body. The identification of pressures will thus form the basis for formulating appropriate action to achieve the WFD’s environmental objective “good surface water status” by 2015.

³² According to article 4 of the WFD it is possible to extend the deadline to 2021 (and possibly 2027) if certain conditions are met in the RBMP’s.

Priority Substances', established at EU level by virtue of Annex II of Directive 2008/105/EC on environmental quality standards (EQS Directive),³³ as well as certain substances deemed harmful at national level. At EU level TBT compounds are classified as hazardous priority substances, while Diuron and Cybutryne (Irgarol) are on the priority list.³⁴ Among the nationally determined harmful substances copper and zinc are listed in Sweden³⁵ and Denmark,³⁶ but not in Finland. In Finland these substances are thus not part of the assessment criteria for chemical status of water bodies. However, article 11(3) (k) of the WFD explicitly requires the Member States to take measures to eliminate pollution of surface waters not only by priority substances, but also to progressively reduce pollution by other substances which would otherwise hinder the achievement of the environmental objectives.

The overall environmental objective of the MSFD is 'good environmental status' (GES) in the marine environment by 2020 at the latest. Under the Directive, Member States must conduct an initial assessment of the current environmental status of its national marine waters and

the environmental impact of human activities in them. For the Baltic Sea the determination of GES is carried out jointly by the three countries and other contracting parties to the Convention on the Protection of the Marine Environment of the Baltic Sea Area within the Helsinki Commission (HELCOM), which is the governing body of the Convention.³⁷ Within HELCOM, Member States have also developed indicators to allow the assessment of the current environmental status and tracking the progress towards achieving GES.

The 11 so-called qualitative descriptors set out in Annex I of the MSFD are used as a tool to determine what GES means in practice and will describe what the environment looks like when GES has been achieved. Descriptor 8 concerns contaminants in the marine environment.³⁸ Copper and zinc are not used as core indicators for descriptor 8 but are suggested to be used as supplementary indicators providing valuable information for environmental assessment.³⁹ Under the MSFD, Member States must establish a monitoring programme for the ongoing assessment and the regular update of and development of a Programme of Measures (PoM) for the Marine Strategy, designed to achieve or maintain the environmental targets by 2020.

3.1.2 Antifouling in River Basin Management Plans and Marine Strategies

Whether or not antifouling substances other than TBT (and in Sweden copper and zinc) are

³³ Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, OJ L 348, 24.12.2008.

³⁴ Directive 2013/39/EU of the European Parliament and of the Council of 12 August 2013 amending Directives 2000/60/EC and 2008/105/EC as regards priority substances in the field of water policy, OJ L 226, 24.8.2013, p. 1–17.

³⁵ Havs- och vattenmyndighetens föreskrifter (Regulations from the Swedish Agency for Marine and Water Management) HVMFS 2013:19 (4.2).

³⁶ Bekendtgørelse nr. 439/2016 om fastlæggelse af miljømål for vandløb, søer, overgangsvande, kystvande og grundvand. A general limit value for copper is set at 1 µg/l for copper and 7,8 µg/l for zinc (including background concentration). According to the RBMPs only copper appears to be related to antifouling, whereas other main sources of both copper and zinc are listed as waste water and run-off, e.g. Vandområdeplan 2015–2021 for Vandområdedistrikt Sjælland p. 19.

³⁷ Article 6, MSFD.

³⁸ In relation to descriptor 8, GES means that "concentrations of contaminants are at levels not giving rise to pollution effects", Annex I of the MSFD.

³⁹ HELCOM, HELCOM core indicators – Final report of the HELCOM CORESET project: <http://helcom.fi/Lists/Publications/BSEP136.pdf>, p. 38. See also HELCOM, Interim report of the HELCOM CORESET project, Part B: Descriptions of the indicators, <http://helcom.fi/Lists/Publications/BSEP129B.pdf>, p. 203.

considered a pressure on waters in the RBMPs and Marine Strategies is indicative as to whether the contamination of the environment by these substances is considered a significant issue for the obtainment of the environmental objectives. Based on the RBMPs and Marine Strategies, the national water management authorities define which actions should be performed to reach the environmental objectives by means of the PoMs.

The Finnish RBMPs and the Marine Strategy acknowledge that the contamination caused by antifouling paints has an environmental impact, but generally only to the extent it concerns previous use of paints with TBT compounds. The hazardous substances listed in the Hazardous Substances Decree (2006/1022)⁴⁰ implementing the EQS Directive are addressed, but again, among these copper and zinc are not listed. When the Finnish marine environment was assessed and the environmental status and indicators of the same was determined, the Council of State defined certain functional objectives by which the marine environment could be improved. Reduction of bottom paints for boats by developing and promoting harmless mechanical cleaning methods and extensively taking them into use was identified as such a functional objective.⁴¹ However, antifouling matters others than the prohibited use of TBT in antifouling paints are not specified in the RBMPs, and although reducing bottom paints was a functional objective in the above mentioned initial assessment, antifoul-

ing is not specifically addressed in the Finnish Marine Strategy's recently (2016) adopted PoM.⁴²

In Denmark, the article 5-analysis for the marine strategy refers to the possible presence of TBT as well as Diuron and Irgarol, but without more specific indications. It is assumed that the main source of TBT is from handling of harbour sediments. Copper and zinc are also referred to in the analysis, but are not linked to antifouling paints. Organotin compounds as TBT as well as copper and zinc in sediments and biota are also used as indicators for the environmental objectives. There are, however, not yet any environmental quality standards for marine sediments and biota. In the draft PoM⁴³ it is indicated that by 2020 TBT will no longer significantly affect the potential for achieving a good environmental status and that no further measures are needed. It appears that the draft PoM mainly focuses on land-based sources of pollution. The evaluation and classification of the environmental state of water bodies under the WFD prepared for the second generation of RBMPs identified 63 coastal water bodies in risk of not achieving their environmental objective in 2021 due to the presence of priority substances and or other substances with established environmental quality standards. It was, however, not indicated to what extent pollution with antifouling substances is a concern for the 63 coastal water bodies at risk. Neither the first or second generation RBMPs and the PoMs have addressed issues regarding priority substances from antifouling paints in coastal waters

⁴⁰ Valtioneuvoston asetus vesiympäristölle vaarallisista ja haitallisista aineista (2006/1022).

⁴¹ Valtioneuvoston 13.12.2012 päätöksen Suomen merenhoitosuunnitelman ensimmäisen osaan kuuluva aineisto: Meriympäristön nykytilan arvio, hyvän tilan määrittäminen sekä ympäristö-tavoitteiden ja indikaattoreiden asettaminen, 19.10.2012, p. 34. <http://www.ymparisto.fi/download/noname/%7B7D23C52C-5EAA-43C3-90A3-FD8797490508%7D/34441>.

⁴² Ympäristöministeriö, Suomen merenhoitosuunnitelman toimenpideohjelma 2016–2021, Ympäristöministeriön raportteja 5/2016, https://helda.helsinki.fi/bitstream/handle/10138/160314/YMra_5_2016.pdf?sequence=1. General waste management of harbors of any size are identified as an issue subject to improvement in order to “reflect applicable law”, but the background to this is not further explained.

⁴³ Danmarks Havstrategi. Forslag til indsatsprogram, Dec. 2016.

in general. TBT and Diuron are, however, among the indicators used for determining the chemical status of surface water bodies.

In Sweden TBT is considered as one of three substances, which are most problematic in surface waters, thus forming a priority for continuous monitoring.⁴⁴ The Swedish Agency for Water and Marine Management has set the limit value for maximum allowable concentration for TBT in surface water to 0,0015 µg/l and as a yearly average 0,0002 µg/l. For bioavailable copper, there is a yearly limit value in surface water of 2,6 µg/l for the North Sea and 0,87 µg/l for the Baltic Sea.⁴⁵ The corresponding limit values for zinc have been set to 3,4 µg/l for the North Sea and 1,1 µg/l for the Baltic Sea.⁴⁶ In the first RBMP no specific measures were decided in relation to substances in antifouling paint. In the second RBMP, several agencies are requested to further focus on supervision, provide guidelines and further develop policy instruments in order to decrease the levels of e.g. TBT, copper and zinc in order to achieve the environmental quality standards. Further establishments of boat hull brush washes and designated wash down areas are examples of measures that are anticipated.⁴⁷ In the initial assessment of the marine environment under the MSFD, the use of antifouling paints is identified as a pressure affecting biodiversity due to the effects of substances such as copper, Irgarol and TBT.⁴⁸ However, in line with the core indicators of the above mentioned HELCOM CORESET project, copper and zinc are not used as indica-

tors for descriptor 8, *concentration of contaminants in the marine environment*, while TBT is included due to its inclusion as hazardous priority substance listed in Annex X of WFD.⁴⁹ The PoM requires the Environmental Protection Agency, in association with the Swedish Transport Agency, to examine the current levels of TBT in harbours and the marine environment and also to examine the source of the pollution. Further, the current instruments to decrease levels of toxins are to be evaluated.⁵⁰

3.1.3 Legal Status of RBMPs and the Marine Strategies

If the RBMPs and Marine Strategies should have real influence on water management in the member states, it is important to identify their legal status and effect in the national legal systems. A distinction can be drawn as regards the binding, in contrast to non-binding status of the plans as well as regards the environmental objectives and the PoMs. Another distinction relates to what actors are addressed, for example, different public authorities or citizens, and in what way. At EU level, the Court of Justice of the European Union has in the ruling regarding dredging of the Weser River in case C-461/13 Bund für Umwelt und Naturschutz Deutschland, stated that the environmental objectives of the WFD (and the RBMPs) are legally binding in the sense that “*the Member States are required – unless a derogation is granted – to refuse authorisation for an individual project where it may cause a deterioration of the status of a body of surface water or where it jeopardises the attainment of good surface water status or of good ecological potential and good surface water chemical*

⁴⁴ Naturvårdsverket; Övervakning av prioriterade miljöfarliga ämnen listade i Ramdirektivet för vatten, rapport 5801, p. 2, 80.

⁴⁵ HVMFS 2013:19.

⁴⁶ Ibid.

⁴⁷ Vattenmyndigheterna i samverkan. *Förslag på åtgärdsprogram för Södra Östersjöns vattendistrikt*, p. 102.

⁴⁸ Havs- och vattenmyndigheten. *God Havsmiljö 2020 – Del 1: Inledande bedömning av miljötillstånd och socioekonomisk analys*, rapport 2012:19, p. 245.

⁴⁹ Ibid., p. 331–332.

⁵⁰ Havs- och vattenmyndigheten. *God Havsmiljö 2020 – Marin strategi för Nordsjön och Östersjön. Del 4: Åtgärdsprogram för havsmiljön*, rapport 2015:30, p. 31. CHANGE project is in this document (p.177) referred to as the regional coordinator in measures concerning TBT.

*status by the date laid down by the directive.*⁵¹ While this is a clear statement on the binding character of the environmental objectives in relation to authorities administering permit procedures, it does not clearly address activities which are not subject to an authorisation or permit procedure.

In Finland, individuals and companies cannot be obliged directly on the basis of the RBMPs which are approved as administrative decisions, and as such they do not come with direct legal implications.⁵² However, in reality the plans have significantly impacted permitting decisions in Finland despite of their legal status.⁵³ On the other hand, this indirect effect concerns only large-scale activities subject to a permit requirement, not leisure boat marinas as small-scale activities. Therefore, the RBMPs do not come with legal implications for antifouling activities in leisure boat marinas. Finland has not yet officially put forward amendments in the applicable legislation as a consequence of the Weser judgment although the judgment's interpretation of the (binding) character of the WFD environmental objectives is not reflected in applicable law.

In Denmark, the RBMPs and marine strategies do not impose rights and obligations on individuals and companies either. In fact, it has now been made clear that the RBMPs as such are merely informative documents. Nevertheless, it is still possible to appeal the adoption of the RBMPs on procedural grounds. The environmental objectives and the PoMs are for the 2nd genera-

tion RBMPs published as decrees (or statutory orders). This does not, however, make them directly binding upon individuals and companies, but only upon the authorities. It is emphasized in the preparatory works to the Act on River Basin Management Planning that the environmental objectives are only binding as regards the measures specified in the PoM. The wording indicates reluctance in seeing the environmental objectives as generally binding for all public administration, but rather as objectives when designing the PoM. However, the Nature and Environmental Appeals Board seems to consider the environmental objectives as binding in accordance with the Weser-ruling, and in the Statutory Order on Programmes of Measures,⁵⁴ the measures and objectives are established as a binding reference for permits etc. granted by the authorities.

In Sweden, the programmes of measures (both RBMPs and marine strategies) are not legally binding in relation to individuals and companies; instead authorities are bound to implement environmental quality standards (EQS) and PoMs. Only chemical EQSs have a clear legal effect,⁵⁵ while ecological EQSs have not and are thus not sufficiently implementing the WFD as interpreted by the Weser ruling.⁵⁶

3.2 Product Regulation

Chemical substances are generally subject to fully harmonized EU legislation, e.g. as reflected in the REACH Regulation (EC) No 1907/2006. A specific Biocidal Products Regulation (BPR)⁵⁷ ap-

⁵¹ C-461/13 *Bund für Umwelt und Naturschutz Deutschland* (para. 51), ECLI:EU:C:2015:433.

⁵² According to the Constitution of Finland (731/1999), Section 80, only acts passed by the parliament can lay down obligations for individuals and businesses.

⁵³ Instead, the plans are "taken into account" within the permitting procedures under the Water Act and the Environmental Protection Act, and by state and municipal authorities in their activities as applicable. See for example the following cases of the Supreme Administrative Court of Finland, 2010:32, 2010:1869 and 2014:176.

⁵⁴ Bekendtgørelse nr. 794/2016 om indsatsprogrammer for vandområdedistrikter.

⁵⁵ Miljöbalken, Chapter 5, Section 2, p. 1.

⁵⁶ Miljöbalken, Chapter 5, Section 2, p. 4. Olsen-Lundh, C. 2016. *Panta rei – om miljö kvalitetskrav och miljö kvalitetsnormer*. Havsmiljöinstitutet.

⁵⁷ Regulation 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products, OJ L 167, 27.6.2012, p. 1.

plies to biocidal products, i.e. chemical products that are used to control unwanted organisms, laying down evaluation and authorisation requirements at EU and national level. Furthermore, the EU legislation has restricted the marketing and use of some of the most toxic substances, including TBT. In particular, EU Regulation 782/2003 in accordance with the International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention) prohibits the application or reapplication of biocidal organotin compounds on leisure boats as from 1 July 2003.⁵⁸ Furthermore, as from 1 January 2008 ships with organotin antifouling must bear a coating that forms a barrier to the leaching of organotin compounds. Regulation 782/2003 is directly applicable in the Member States and must thus be complied with by boat owners.

Antifouling paint is a biocidal product governed by the BPR. The BPR lays down an EU procedure for evaluation and authorisation of active substances combined with a national authorisation of antifouling paints.⁵⁹ However, the BPR as well as its predecessor the Biocidal Products Directive⁶⁰ contains transitional provisions allowing the Member States to maintain national practices up to three years after the active substance has been authorised at EU level. This means that so far, there has not been an absolute EU requirement of national authorisation procedure for antifouling paints. It is, however, prohibited to allow marketing of new biocidal products if the active substance has not yet been subject to evaluation at EU level. Due to the transitional rules different forms of product regulation may

exist at Member State level, i.e. an authorisation approach or a restriction approach. While Denmark has chosen the latter, Sweden and Finland both apply an authorisation procedure.

After the expiry of the transitional rules the Member States must adopt an authorisation approach in accordance with the BPR. It remains to be seen, however, to what extent national variations as regards authorisation of biocidal products will be allowed under the BPR. The Member States will be able to derogate from the mutual recognition rules e.g. with reference to environmental protection concerns.⁶¹

3.2.1 *Product authorisations*

Sweden has applied a procedure for authorisation and notification of biocidal products, including antifouling paints, since the 1970's. In 2016 a total of 45 antifouling paints have been authorized and 27 of those products were authorized for leisure boats. However, only 16 products are allowed for leisure boats with main mooring point on the east coast (Baltic coast) and no products are authorized for use in the Gulf of Bothnia and inland waters. Based on the Chemicals Act,⁶² Finland also has an authorisation procedure for biocidal products, including antifouling paints, which refers to the substantive provisions of the Biocidal Products Regulation. On 1 January 2016, 15 antifouling products (biocides) for consumer use were listed as approved products in Finland.⁶³

Denmark has chosen to use the transitional measures of both the Biocidal Products Directive and the Biocidal Products Regulation and

⁵⁸ Regulation (EC) No 782/2003 on the prohibition of organotin compounds on ships.

⁵⁹ Antifouling paints are specified as product type (PT) 21.

⁶⁰ Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market.

⁶¹ Art. 37, see Nilsson, J. & Gipperth, L., Antifouling for leisure boats in the Baltic Sea. A review of the European Union chemicals and water legislation, 2015, available at <http://law.handels.gu.se/forskning/skriftserien>.

⁶² Kemikaalilaki (599/2013).

⁶³ Tukes, Luettelo sallituista kiinnittymisenestoaineista, 7 January 2016: http://www.tukes.fi/Tiedostot/Kemikaalituotteet/biosidit/Luettelo/AF_luettelo_070116.pdf.

has maintained the existing national rules until active substances are authorised at EU level. The existing authorisation procedure for biocidal products has not included antifouling paints. This means that in Denmark there has not yet been an authorisation requirement for antifouling paints.⁶⁴ On the other hand, Denmark has restricted the marketing and use of different substances in antifouling paints, see below.

The different approaches when implementing the EU biocidal products legislation makes it quite difficult to compare the legislation in the three countries. There are, however, some similarities despite the difference in choosing an “authorisation approach” or a “restriction approach.” In Sweden antifouling paints are only authorised for boats weighing at least 200 kg. A similar restriction exists in Denmark as it is prohibited to import, sell and use any antifouling paints on leisure boats in saltwater, if the boat weighs less than 200 kg (unless it is a wooden boat or it has a berth in an A or B port).⁶⁵ In Finland there are no restrictions as to the size or weight of the boat. However, the use of antifouling paints is not allowed in Finnish inland waters.⁶⁶ As for the use of authorised paints in Sweden and Finland, the boat owner shall comply with the product’s instructions of use and any restrictions on use of antifouling paints as established by authorisation procedures or otherwise.⁶⁷

⁶⁴ A notification and registration is, however, required for biocidal products containing active substance that are subject to assessment, cf. Statutory Order 151/2014 (Bekæmpelsesmiddelbekendtgørelsen).

⁶⁵ For boats that predominantly sail in freshwater a general prohibition of antifouling paints apply, cf. Statutory Order 1429/2014.

⁶⁶ Still, some municipal regulation concerning antifouling-products does exist even in some inland municipalities.

⁶⁷ The Finnish Chemicals Act (599/2013), Section 35; Swedish Environmental Code (1998:808) Ch. 14, section 8 and the Regulation on pesticides from the Swedish Chemical Agency (KIFS 2008:3).

3.2.2 *Specific product restrictions*

In particular copper-based paints can be subject to specific restrictions. In Denmark it is prohibited to import, sell and use antifouling paints that release more than 200 µg copper/cm² within 14 days and 350 µg copper/cm² within 30 days. A similar maximum leaching rate of 15 µg/cm²/day is used in Finland as part of the risk assessment in the authorisation procedure for antifouling products. Sweden also applies specific criteria regarding copper(I)oxide concentrations as part of the authorisation procedure.⁶⁸

In Denmark the import, sale and use of Irgarol paints is also prohibited and Diuron is not allowed on the market as it is not subject to an evaluation at EU level. A general ban for leisure boats of all paints that release substances with risk phrase R53 (“may cause long-term adverse effects in the aquatic environment”) will apply with effect from January 2018.⁶⁹

In Finland and Sweden restrictions on the use of antifouling products can be part of the authorisations and are at least in Finland directed at the permit holder, i.e. the actor placing the product on the market. Some Finnish restrictions are that leisure boats cannot be spray painted (i.e. only brush and roller application is allowed). In Finland, supervision by Tukes, the biocide authorisation agency, is directed at the permit holder who is the regulated actor in the product authorisation procedure and will predominantly seek to assess whether the limitations and restric-

⁶⁸ The calculations are based on the so-called MAMPEC model, see also European Commission Joint Research Centre; Technical Guidance Document on Risk Assessment, pp. 99–106 and the Biocidal Products Regulation Annex VI.

⁶⁹ Originally the ban was set to enter into force in January 2003 (Statutory Order 761/1991), but it has now been postponed five times with reference to the delays in the EU procedures for authorising active substances.

tions, issued in connection with authorisation, are complied with.⁷⁰

3.3 Environmental Protection Regulation – marinas and boat owners

From the perspective of direct regulatory control of polluting activities, the practices or activities of boat owners, boat clubs or marinas fall into different categories. Firstly, it is relevant to look into the general environmental protection legislation and particularly examine the extent to which an environmental permit is needed for a marina or other facilities for leisure boats. Secondly, handling of waste – both solid waste and wastewater – is an important issue if harmful substances are at stake. A further refinement of rules can thereafter be made; the regulation of the boat owners' conduct and/or marina activities may be subject to both public law in the form of acts, decrees or executive orders, but also to private law arrangements, for example, rules of association and codes of conduct. These different types of rules imply that antifouling activities are subject to rules of varying legal character and degrees of compulsion – and in particular different levels of supervision and control.

Boat owners' antifouling practices would in addition to use (application) of the actual paint also cover both the maintenance of the boat and related waste management (i.e. scraping off old paint and handling of dust and scrapings). The leisure boat marina and the boat club are as regulated actors subject to legal requirements on a varying scale in the three countries. From the perspective of addressing adverse impacts of antifouling paints, a variety of rules are relevant. It should also be kept in mind that EU Regulation 782/2003 imposes directly applicable obligations upon boat owners as regards the use of TBT as

well as regards the coating of boat hulls previously painted with TBT paints.

In addition to public and private law requirements, soft law instruments such as eco-labelling schemes may also address antifouling activities. This is the case in relation to the Blue Flag Marina programme promoting an environmental code of conduct for boat owners.⁷¹

3.3.1 *Environmental permits and wastewater regulation*

Environmental permits might be one way of regulating polluting activities in marinas or harbours by means of, for example, a comprehensive and integrated permit covering all (or almost all) pollution issues, or in the form of separate permits for specific pollution issues, e.g. wastewater.

In Finland, leisure boat marinas as in contrast to industrial harbours, are not subject to a permitting requirement or other equivalent normative control under the Environmental Protection Act (527/2014). The Act contains an unconditional prohibition of soil and ground water contamination.⁷² This is not, however, connected to substantive requirements with regard to antifouling paints. The Environmental Board of a municipality may, however, on the basis of the Environmental Protection Act, issue municipal environmental protection regulations which relatively often cover boat maintenance and waste management of paint scrapings and dust.⁷³ These

⁷¹ See <http://www.blueflag.global/marinas-1/>

⁷² The Finnish Environmental Protection Act (527/2014), sections 16 and 17. In theory, even marinas might need a permit (based on Finnish Environmental Protection Act 27 § 2, because they can cause water pollution. Still permits for marinas have not been required in practice.

⁷³ For example, environmental protection regulations of Helsinki, Porvoo and Parainen. Approximately 2/3 of coastal municipalities in Finland (n=62) have municipal environmental protection regulations. In addition to these, the Åland island has 16 municipalities with none municipal or regional environmental protection regulations. In 20 municipalities (mostly South Coast) address

⁷⁰ The Finnish Chemicals Act (599/2013), Section 30 and Chapter 7.

may, for example, specifically address the manner of boat maintenance to avoid paint scrapings and dust to end up in the environment. The municipal regulations seem to be quite extensive, though from a legal perspective, rules tend to be quite vaguely formulated. Washing may be allowed if it is "non-professional", "occasional", "does not cause harm to the nature or the neighbours" and when the paint is being scraped, the dust shall be collected "as far as possible" or the amount of dust which ends up to the nature shall be "minimized". The supervision of use is the task of the municipal/town environmental protection authority if specific environmental protection regulations addressing antifouling practices have been issued.⁷⁴

In Denmark, there is no general environmental permit requirement for leisure boat marinas either. However, separate permits may be needed, e.g. for wastewater discharges, and local harbour regulations may also include rules on polluting activities, see below. Furthermore, the establishment of a marina will be subject to EIA requirements and possibly an assessment of the potential impact on Natura 2000-sites. It is mainly spatial planning interests and the protection of the coastline and coastal waters that are taken into account when deciding on new facilities not connected to existing harbours or marinas.

In Sweden marinas are neither required to acquire a permit or notify authorities of its environmentally hazardous activity. They are, however, obliged to adhere to the general rules of conduct and fulfill the requirement to con-

trol their operation. This means that marinas and boat owners are required to have sufficient knowledge about the environmental effects of their activities and take precautionary measures to avoid or at least minimize these effects. Commercial marinas also need to prove that they use the best technique economically feasible.⁷⁵ The local municipal committee is responsible for supervision of the application and use of the antifouling paints.⁷⁶ Each municipality is autonomously organised and due to the lack of specific national rules or guidelines for marinas and boatyards, except for the target values for wastewater from wash down areas, the supervision and assessment may vary considerably. Currently, regional environmental cooperation exists for twelve different regions in Sweden between different local authorities serving as a forum to harmonise the practice and assessment.⁷⁷ The general ban of discharge of wastewater may also affect marinas but there is a possibility to obtain a wastewater permit.

3.3.2 Waste Management

General waste management is regulated in EU Member States level through implementation of the Waste Directive. In addition, a specific Directive on port facilities for ship-generated waste⁷⁸ sets a requirement to establish a waste handling plan for ship-generated waste. This does not, however, apply to antifouling substances. Under Finnish waste law, the operator of a harbour or an area for public recreational use is obliged to

antifouling activities, while the rest settle with regulating washing boats and other vehicles.

⁷⁴ In a recent inquiry (Janne Seppälä 2016–2017, unpublished [yet]), the municipal environmental officials have been asked how often they get questions from citizens or how often they do supervision visits to the marinas concerning antifouling-activities. The answers varied mostly from never to once a year. From that perspective the tone of rules is appropriate.

⁷⁵ The Swedish Environmental Code (1998:808), chapter 2 section 3 and 7.

⁷⁶ Miljötillsynsförordning (2011:13), chapter 2 section 31 p.5.

⁷⁷ See www.miljosamverkan.se/Sv/om-miljosamverkan/Pages/default.aspx.

⁷⁸ Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues, Official Journal L 332, 28/12/2000 P. 0081 – 0090.

arrange for sufficient waste collection and other waste management services in respect of the normal activities conducted in the area. This obligation gives effect to the littering prohibition in Section 72 of the Finnish Waste Act (646/2011)⁷⁹ which prohibits the release of waste (which is deemed to include scrapings of antifouling paints) with a risk to injure humans or animals or cause any other comparable risk or inconvenience. The Waste Act also lays down certain general obligations as to the treatment of waste; for example, the collection of waste cannot lead to emissions causing a risk of contamination of the environment.⁸⁰ This would imply an obligation on the boat owner, but it is very difficult and ineffective to supervise compliance of individual boat owners. As mentioned above local environmental protection regulations may include rules as regards antifouling practices.

In Denmark the general waste regulation is supplemented by local regulations for harbours and marinas in accordance with the Harbour Act. The standard regulation on the use of Danish marinas and small fishing harbours, includes rules for the boat owner when maintaining the boat. According to this repair work should always be done in accordance with environmental regulations, and the waste produced from the work must always be collected and disposed of in accordance with the instructions of the marina and the environmental regulations. Cleaning of vessels that are painted with biocidal antifouling paints may only be done in designated areas if available. It is common, that the marinas provide further guidelines on how to handle dust and scrapings on their websites. There are also examples of marinas that set more strict requirements concerning dust and scrapings, where

only equipment and methods approved by the board of the marina are allowed.

In Sweden the general rules of consideration in the Environmental Code require both individual boat owners as well as marinas to take precautionary measures to minimize the risks of waste. Paint residues, sludge and other materials from scraping and cleaning boat hulls containing hazardous substances, must be treated as hazardous waste and needs to be disposed by an authorised company. The Swedish Agency for Marine and Water Management guidelines for wastewater includes target values for substances that may be emitted from the hull such as TBT, copper and zinc. Marinas are also required to develop a waste management plan, in which it is declared how much e.g. paint residues it will handle and how this waste is taken care of.⁸¹ National grants have been provided to applying municipalities and non-profit associations for wash down areas and stationary boat hull cleaning devices.

3.3.3 Rules of Association, Codes of Conduct

In addition to public law rules, a boat owner mooring in a marina may be subject to regulations or codes of conduct established by the marina itself or by boat clubs/associations, particularly regarding the practices related to boat maintenance and waste management. A marina may be interested to set internal rules as it may be liable for pollution caused by boat owners. In comparison with the public rules supervised and enforced by the relevant authorities, private law requirements are primarily supervised and enforced by the private actors, i.e. marinas or associations.

In Finland, a boat club is normally a registered association to which the Associations Act (503/1989) is applicable. Associations are obliged

⁷⁹ Jäteläki (646/2011). The Finnish Waste Act, Section 76; Government Bill for a Finnish Waste Act 199/2010, page 115.

⁸⁰ The Finnish Waste Act, Chapter 2, Section 13.

⁸¹ Regulation from the Swedish Maritime Administration SJÖFS 2001:13.

to establish statutes in which the functioning of the association are spelled out, but the Act does not set out a legal requirement to cover environmental issues in the statutes. Changing rules of a club may demand a qualified majority and suspending a club member may sometimes be difficult or seen as inappropriate. Therefore, certain clubs, such as the Esbo sailing association, have established their own environmental codes of conduct in the form of recommendations to club members as to the protection of the environment and waste management in antifouling practices.⁸² Setting out terms and conditions for sub-lease contracts may also be an effective private law arrangement.⁸³

In Denmark the marinas enact their own regulations for use of the marina according to the Harbour Act, i.e. public law regulations. Such local regulations may include instructions for both the use of biocidal paints, maintenance practices and the handling of waste as dust and scrapings. There are also examples of marinas or boat clubs including private law requirements on handling biocidal paints in their Articles of Association together with rules of procedure, membership, etc. Such privately enacted rules can for example declare that the use of banned antifouling paints will cause loss of the right to a berth in the marina, and be regarded as a major misconduct of membership.

In Sweden the boat clubs establish private codes of conduct for the use of the marina, often combined with a specific environmental plan. It is the boat clubs that control compliance with the internal rules and decides on sanctions for non-compliance. These documents are in general

similarly constructed due to nation-wide collaboration between the boat clubs, with some using more specific provisions than others. The rules often consist of an explicit prohibition for the use of unauthorized antifouling paint, an obligation to collect and manage waste from painting, washing and scraping the boat and reference to guidelines provided by the Environmental Protection Agency, the Chemical Agency or other authorities. Some boat clubs also implement environmental plans containing long-term provisions, such as the aim to eliminate the use of toxic antifouling paints altogether and continuous work towards environmentally friendly standards and practices. These privately enacted codes of conduct or environmental plans are also a way the boat clubs use to fulfill the requirement for operators to monitor and control its activity in relation to the general requirements in the Environmental Code. Thereby, they can also be a useful tool for supervisory authorities in their examination of a marina.

3.4 Contaminated Soil and Sediments

Many boatyards and marinas in all three countries are contaminated by harmful substances due to the use of antifouling paints for decades, including TBT, copper and zinc.⁸⁴ The contamination may apply to land areas, e.g. those used for maintenance boats, as well as sediments in and around the marina. From a regulatory perspective, contaminated soil and sediments primarily falls into two different categories: 1) rules on liability for clean-up of contaminated soil, and 2) rules for registration and handling (pil-

⁸² Esbo Segelförening, Miljöprogram för Esbo Segelförening r.f.: <http://esbosegelforening.fi/foreningen/miljoplan-for-esf>.

⁸³ Termination of a (sub)lease contract is usually easier than limiting a member's rights or suspending a membership.

⁸⁴ Eklund, B., Johansson, L. & Ytreberg, E., Contamination of a boatyard for maintenance of pleasure boats, *J Soils Sediments* (2014) 14:955–967 and Eklund, B. & Eklund, D., Pleasure Boatyard Soils are Often Highly Contaminated, *Environmental Management* (2014) 53:930–946.

ing, dredging and dumping) of contaminated soil and sediments.

3.4.1 *Liability for contaminated soil and sediments*

Liability rules for contaminated soil in Finland are based on the polluter pays principle. Public law liability is allocated through primary and secondary liability rules, under which the holder⁸⁵ of a land area may be liable if the polluter cannot be identified or obliged and if contamination has occurred with the holder's consent. The municipality may, nevertheless, ultimately be liable for remediation if the holder cannot be obliged to remediate.⁸⁶ For contaminated soil, the Decree (214/2007)⁸⁷ on the assessment of remediation needs sets out threshold values which triggers investigation and/or remediation obligations in relation to heavy metals and hydrocarbons, inter alia, copper, zinc, lead, nickel and PAHs.⁸⁸ Finnish law does not explicitly cover liability for contaminated sediments, but in practice dredging activities could trigger a remediation obligation by the party undertaking dredging because this activity may release contaminants.

In Denmark most storage areas in marinas are believed to be registered as contaminated due to the pollution with dust from boat maintenance and other activities. Clean-up of contaminated land is a complicated issue depending not only on who can be held liable, but also on when the pollution has occurred. If the pollution has taken place before 1 January 2001 the Environmental Protection Act (1189/2016) provides a legal basis for clean-up or remediation orders to

polluters. According to court rulings such orders must be based on negligence. If the pollution has taken place after 1 January 2001 it is possible to hold operators of marinas liable for clean-up in accordance with the Contaminated Soil Act (1190/2016).⁸⁹

In Sweden, the legal liability for the contamination of boat yards and marinas is first and foremost placed on the polluter – that is the operator (boat clubs or private companies). If no operator is found the landowner might ultimately be responsible for the clean-up. If it is not possible to hold either a former polluter or a landowner liable, the government provides national funding to cover the costs of remediation. In practice the government or a subsequent exploiter of the land often are the ones that pays for the remediation.

3.4.2 *Handling of contaminated soil and sediments*

Disposal and management of contaminated sediments in Denmark has been on the agenda since the 1980-ies. The Environmental Protection Agency initiated in 2000 a number of projects in order to establish strategies for the management of contaminated sediments from harbours. Most of the published knowledge dates back to those initiatives. The sediment can generally be dealt with in two ways. It can either be dumped at sea or stored on land at designated dumpsites or areas where the use or storage of contaminated soil causes no risk for further contamination of soil or groundwater resources. Dumping the sediment at sea is by far the most inexpensive and the preferred solution for the marinas. Dumping of dredged materials is subject to a permit cf. § 26 of the Act on Protection of the Marine Environment. The permit can only be granted if the contamination is in insignificant quantities and concentrations. When it comes to concentrations of pollut-

⁸⁵ It is important to notice that in lease situations it is not always clear who is to be deemed the 'holder' of a land area. It can be the lessee or the lessor (owner) and this is defined case-by-case.

⁸⁶ Ympäristönsuojelulaki 527/2014, Section 133.

⁸⁷ Valtioneuvoston asetus maaperän pilaantuneisuuden ja puhdistustarpeen arvioinnista (214/2007).

⁸⁸ The threshold value for copper is 200 mg/kg dw (dry weight).

⁸⁹ Bekendtgørelse af lov om jordforurening (Consolidated Act 1190/2016).

ing substances – including copper and TBT from antifouling paints, the sediments are categorized in A (Cu < 20 mg/kg dw (dry weight), TBT < 7 ug/kg dw), B (Cu 20–90 mg/kg dw, TBT 7–200 ug/kg dw) and C (Cu > 90 mg/kg dw, TBT > 200 ug/kg dw). Category A sediment is always suitable to dump. Category B sediment is subject to an individual evaluation, but will normally be dumped on a suitable site at sea. Category C sediment will normally have to be deposited on land. When it comes to quantities, there is a total limit on the amount of TBT and copper to be dumped from a single port or harbour. The rule of thumb is 1 kg TBT and 200 kg copper per year.

Dredging of contaminated sediments in Finland may require a permit if there is a risk of contaminating waters or the environment. A permit for dredging is needed under the Water Act (587/2011) if the quantity of dredged material exceeds 500 m³, unless it is a question of maintenance of a public waterway. Although not specified in law but in ministerial guidance, dredging of sediments contaminated by copper must, through a dual threshold system, assess the concentrations of contamination based on which the dredged masses' eligibility for dumping at sea is determined. Concentrations exceeding Cu 90 mg/kg dw are unsuitable for dumping, and the corresponding amount for TBT is over 150 ug/kg dw.⁹⁰

In Sweden there is a general prohibition of dumping materials e.g. from dredging.⁹¹ The prohibition is subject to exemption in cases where land disposal is not a viable option for the operator but the dredged material must still be within acceptable level of contamination. Unlike Finland and Denmark, there are no limit values for copper and TBT in dredged material and val-

ues may vary from case to case. The limit value for TBT in sediments in order to determine good chemical water status (1,6 ug/kg dw) will, however, most likely lead to a more strict application of the possibility to grant exemptions from the ban of dumping.

3.5 Supervision and enforcement

Effective supervision and enforcement is a crucial element of environmental legislation. Supervision and enforcement is, however, also resource demanding. This is in particular the case when dealing with diffuse pollution sources and several potential "polluters" that are not easily identifiable. Supervising the activities of individual boat owners is a particular challenge.

In relation to the marketing and use of antifouling paints an effective control system should in principle be capable of controlling the availability on the market of non-authorised products as well as the use of such products by individual boat owners. Furthermore, effective sanctions – either administrative or criminal – are required to address (and prevent) unlawful behaviour. This does not, however, appear to exist in any of the three countries. There appears to be no reported criminal cases regarding non-authorised antifouling products. Administrative sanctions are available in Sweden, but not in Finland and Denmark. Another – and possibly more effective – option is to encourage marinas or boat owner organisations to either contribute to appropriate supervision of public law requirements or to establish their own codes of conduct within a private law setting.

In all three countries, supervisory powers are distributed among different authorities. In Denmark, the marketing and use of chemical products is supervised by the Environmental Protection Agency, whereas the supervision of waste and wastewater rests with the local authorities. This may also include supervision of

⁹⁰ Ympäristöministeriö, Sedimenttien ruoppaus- ja läjitysohje, Ympäristöhallinnon ohjeita 1/2015, pp. 40–42.

⁹¹ Environmental Code (1998:808), chapter 15 section 27.

boat owners' use of antifouling paints, e.g. in the form of inspection campaigns. Furthermore, the local harbour authority (often the board or the local council) should supervise harbour regulations. There are no official records on the number of supervisory actions and so far it has not been possible to identify any recorded criminal cases regarding antifouling paints in Denmark. Administrative sanctions are in general not used in Danish environmental legislation and former rules on administrative fines in harbour regulations were abandoned in 2002.⁹² Similarly, there are no records as regards sanctions under privately enacted codes of conduct although some marinas have such rules in place where the use of banned paints may cause the loss of a right to a berth in the marina or be regarded as a major misconduct of membership.

The fragmentation of the regulatory landscape described above is equally visible in supervision and enforcement of the relevant Finnish and Swedish regulations. In Sweden the Chemicals Agency is supervising the general marketing and use of chemical products and local municipal authorities supervise the application and use of paint. The Agency for Water and Marine Management as well as the Environmental Protection agency supervise the status of the environment on a national level, while regional as well as local authorities have the responsibility to supervise the operations affecting the environment. If a boat owner or a person working in a marina is using an environmentally harmful antifouling product when a less harmful product fulfills the same purpose, penal provisions for "environmentally hazardous handling of chemicals" can be imposed according to the Environmental Code. Serious pollution by chemicals can be regarded as an "environmental offence". These sanctions are, however, unlikely to be deemed

applicable if the provisions from the Chemical Agency are followed.⁹³ The act must also cause harm to people or the environment or have a risk of causing such harm. Less serious offences or violations of prohibitions and regulations issued under chapter 14 can be regarded as "unlawful handling of chemicals".⁹⁴ There is, however, a lack of case law of the penal provisions in the Environmental Code being applied in relation to antifouling paints. Each municipality is autonomously organised and due to the lack of specific national rules or guidelines for marinas and boat clubs, except for the substance target values for wastewater from wash down areas, the supervision and enforcement may vary considerably between local authorities. Regional environmental cooperation between local authorities may, however, be a new forum to harmonise the practice and assessment.⁹⁵

According to the Finnish Chemicals Act, a boat owner who negligently or intentionally breaches the obligation of using antifouling paints in a qualified manner and according to the products' instruction of use shall be sentenced to payment of a criminal fine for a "chemical violation".⁹⁶ Impairment of the environment can be counted as a crime as well.⁹⁷ Adminis-

⁹³ See also Miljöbalk (1998:808), Ch. 2 section 4 regarding the principle of choosing a suitable chemical product.

⁹⁴ Miljöbalk (1998:808), Ch. 29 section 3a.

⁹⁵ See www.miljosamverkan.se/Sv/om-miljosamverkan/Pages/default.aspx.

⁹⁶ The Finnish Chemicals Act (599/2013), 59 §.

⁹⁷ A person who, intentionally or through gross negligence, uses, handles or stores a substance in violation of the Chemical Act, the REACH Regulation, the CLP Regulation, the Biocide Regulation or a provision given on the basis of these or of the Environmental Protection Act, so that the act is conducive to causing contamination of the environment, other corresponding environmental despoliation or littering or health hazard, shall be sentenced for impairment of the environment to a fine or to imprisonment for at most two years (Criminal Code, chapter 48, section 1).

⁹² Statutory Order 9139/2002 § 2.

trative fines are not used in Finland.⁹⁸ Tukes is responsible for supervision of compliance with the Chemicals Act. Tukes is, however, not performing downstream supervision of compliance with antifouling paints' instructions of use. The Danish Environmental Protection Agency has, on the other hand, performed inspections on the use of antifouling paints and their related waste management. No use of illegal paints was found during these inspections. In Sweden, the supervision of use is explicitly mentioned in the regulations, and the division of supervisory tasks as to suppliers and users of paints is explicitly stated in legislation.⁹⁹

4. Discussion and comparative remarks

4.1 General Remarks

From the perspective of general legal frameworks and related public authorities with their respective regulatory responsibilities, all three countries appear to apply a somewhat patchy or fragmented approach to the separate matters related to antifouling paints, for example, environmental quality (e.g. water quality), chemical products (e.g. authorisations or restrictions) and waste handling. The fragmented legal framework without an integrated, life-cycle perspective on antifouling may hinder a coherent approach to adequately address the harmful effects of antifouling paints. Thus, an integrated regulatory approach (considering all the different issue areas in a coherent manner) is lacking in all three countries, although the Swedish Environmental Code would possibly come the closest to this. Furthermore, the regulatory focus has a rather uneven emphasis on the different matters

relevant to antifouling paints; legislation in all three countries focus mainly on the authorisation or other restrictions on marketing and use of the antifouling paints, i.e. product legislation, whereas there is less focus on antifouling paints in relation to e.g. waste handling and the practices of boat owners and marinas. In addition, having several authorities involved in regulating antifouling issues may lead to lack of coordination, or even worse, negligence of problems that do not clearly fall within the competence of one authority. An increased emphasis on the regulation of environmental quality and the implementation of the WFD and MSFD might, however, force member states to address the environmental quality problems related to antifouling paints and the need to reduce risks of pollution and to clean and restore sensitive coastal areas from antifouling substances.

4.2 Environmental quality regulation

The WFD and the MSFD establish a legal framework for the regulation of both ecological and chemical water quality. The extent to which this framework addresses antifouling matters depends, however, on which substances in paints are considered to be a threat to water quality. In this respect only TBT compounds have been identified as a hazardous priority substance, while diuron and cybutryne (Irgarol) are classified as priority substances. Copper and zinc are not identified as hazardous substances at EU level but might be addressed at national level. This means that antifouling is not as such necessarily considered an important issue in the RBMP's and marine strategies apart from TBT issues which are mainly linked to the handling of contaminated sediments. However, Sweden has in 2016 decided on general limit values for copper and zinc, and general measures to avoid exceeding these have been adopted in the new programme of measures (PoM). In the environ-

⁹⁸ Administrative compulsion can be applied in Finland. An owner of a polluted land may be obliged to clean sediments and a conditional fine can be used to motivate the owner.

⁹⁹ Miljötillsynsförordning (2011:13), chapter 2, section 31, p. 5, section 21 and 19 p. 16.

mental quality regulation, a main issue is thus to what extent antifouling paints (apart from TBT) are considered a water quality problem, i.e. the scope of environmental objectives and appropriate measures. Another regulatory issue is related to the legal effect of the environmental objectives. It is clear from the Weser-ruling of the CJEU that the objectives are legally binding on the authorities when deciding upon permit applications etc. Most antifouling issues are, however, not subject to permit requirements – except product authorisations and handling of sediments. In order to fulfill the objectives of the directives, Member States however need to take measures also to avoid further pollution from non-permit activities.

4.3 Product Regulation

Despite the existence of a harmonising EU regulation on biocides, it appears that quite different regulatory approaches to antifouling products exist in the Member States. The regulatory leeway in this area is thus wider than expected primarily due to the transitional rules allowing the Member States to continue applying current practices for up to three years after the date of approval of the last of the active substances to be approved in that biocidal product. Even after the expiry of the transitional rules the Member States will retain some options for taking national issues into account in the national authorisation of biocidal products and also to derogate from the mutual recognition due to e.g. the protection of the environment. Sweden and Finland apply an authorisation approach, while Denmark with reference to the transitional rules has maintained a restriction approach with respect to antifouling paints. In the authorisation approach, regulatory control is predominantly being directed at the party making available the product on the market, i.e. the actor responsible for import, sales and marketing, and is not concerned with

downstream (boat owner) use of the product although restrictions on use may be part of the authorisation for marketing. In other words, in the countries choosing the authorisation path, the regulatory control in relation to the product is normally not directed at the boat owner or the marina. Using a restriction approach can to a larger extent be viewed to be directed towards the boat owners. The restriction approach in Denmark is, however, likely to be replaced by the authorisation approach in accordance with the EU BPR after the expiry of the transitional rules.

4.4 Environmental protection requirements – marinas and boat owners

The environmental regulation of activities of marinas and boat owners varies in the three countries. In general, marinas are not subject to specific environmental permit requirements. Pollution related to the handling of antifouling paints in marinas or by boat owners, e.g. maintenance and scraping, is mainly subject to general rules and standards regarding waste and wastewater. Apart from general prohibitions on discharge of polluting substances, more detailed requirements regarding waste management are often established at local level by the local authorities. Thus, it's difficult to get a clear picture of restrictions as regards maintenance, scraping etc. as they may vary from one municipality or one marina to another. Furthermore, such activities are even more unlikely to be regulated outside marinas. Activities of boat owners may, however, not only be subject to public law requirements, but also to private law requirements, e.g. in the form of codes of conduct of boat owner associations or marinas. Such private law requirements may turn out to be more effective in terms of (private) supervision and enforcement by the associations or marinas if appropriate sanctions exists, e.g. loss of the right to a berth in the ma-

rina. There is, however, very little knowledge about such private law arrangements and their functioning.

4.5 Liability for and handling of contaminated soil and sediments

Liability for contamination and remediation is based on the polluter pays principle in all the three countries. As contamination by antifouling paints has been caused during a long time and by multiple actors, the allocation of liability is rather complicated in practice. Because of this, individual liability for private boat owners using a marina seems less likely. It is more likely that marinas and boat clubs can be held liable for clean up or remediation, although their lack of economic resources might also lead to liability for land owners (often the municipalities). There are, however, no recorded liability cases related to antifouling paints in any of the countries. It appears that the general liability rules are too blunt to deal with contamination by antifouling paints caused by individuals – and possibly also marinas.

Legislation in all three countries recognise the presence of copper and other antifouling substances in soil and sediments at certain concentrations as a contamination. Handling sediments, e.g. dredging of harbours and waterways or other activities affecting the seabed, will in most cases require a permit. In Finland, however, there are some limitations to the permit requirement for minor dredging below 500 m³. In permit systems, the environmental quality objectives or standards should be taken into consideration, which may result in restrictions or thresholds for the dumping of contaminated sediments offshore. Thus, a high level of contamination by antifouling substances may necessitate depositing the sediments on land which is normally much more costly than dumping at sea. Such expenses may indirectly support initiatives by

the harbours or marinas to minimize pollution by antifouling paints, e.g. by codes of conduct or harbour regulations.

Thus, the costs of handling contaminated sediments as well as a potential liability for clean-up could be used to push regulatory control towards private regulation in marinas in order to promote behavioral change within the boat club. The boat club or marina typically leases the land area from the municipality or another land owner. In these situations, the lease agreements could be equipped with clauses on transfer of liability for contamination on the lessee, i.e. the marina. In turn, this could provide an incentive for the marina to develop internal environmental codes of conduct to avoid contamination.

4.6 Supervision and enforcement

Supervision and enforcement is a crucial underpinning for most regulatory instruments. In relation to antifouling paints there are not only several authorities involved in supervision – both at national, regional and local levels. There are also several actors to supervise, including harbours, marinas and not least individual boat owners. The supervision of individual boat owners is a particularly difficult and resource-demanding task. Thus, the distribution of supervisory powers among different authorities must be considered carefully. Local authorities are not necessarily equipped with sufficient resources, whereas national authorities may be too far away. Nevertheless, it appears that inspection campaigns, e.g. by the Danish Environmental Protection Agency, can be carried out successfully, particularly if there is a possibility in practice to control the paints used. In general, however, it could be considered whether private associations and marinas can play a larger role as regards supervision and enforcement – both with regard to public law requirements (e.g. harbour regulations) and/or private law arrangements, e.g. codes of

conduct. Different requirements, e.g. potential liability for clean up or remediation, as well as appropriate guidelines, might serve as an incentive for marinas and clubs to supervise and guide its members.

As regards enforcement, another issue is whether administrative sanctions can be used, or whether enforcement is based on criminal sanctions and court cases by a public prosecutor. Administrative sanctions might be more feasible to address minor cases involving non-compliance regarding e.g. maintenance and scraping of boats. However, it appears that administrative sanctions are not really used in relation to anti-fouling paints and in Finland and Denmark they are not used at all.

5. Conclusions

The legislation related to antifouling paints and practices addresses a range of different actors and has varying legal implications on different regulatory levels. Nevertheless, it seems that the most central actor as to the contamination by antifouling substances is the boat owner who uses the antifouling paints and the context in which this activity occurs, i.e. the leisure boat marina or boat club. In the three jurisdictions analysed, environmental quality regulation is unable to directly oblige the boat owner or the marina to take sufficient measures and conduct. Environmental protection law and waste law generally exclude smaller leisure boat marinas and boat clubs from permitting and waste management requirements. In product regulation, the authorisation and restriction procedures of antifouling paints function as an 'advance supervision' of chemical safety requirements to the extent that the leaching rates of a potential product are verified by the authority in advance. But when it comes to actual application of paint on the boat hull, compliance with product instructions/limitations is generally not supervised – presumably

due to a lack of resources. From a perspective of compliance and enforcement, further direct regulation of boat owners or marinas on the basis of general environmental protection law may, however, not constitute the 'silver bullet' to sufficient environmental protection. Another option could be to encourage private law arrangements and "self-enforcement" by e.g. the marinas or boat owner associations.

The descriptive sections of this article goes to show that the regulatory landscape for these activities is scattered at many levels with different implications related to different regulatory perspectives, i.e. environmental quality, products and polluting activities. The regulatory frameworks are fragmented and uncoordinated in relation to the overall issue of antifouling paints and practices, and they have yet to reach their full potential as instruments of environmental protection. Another issue is that the EU legislation does not fully harmonise the national legal framework. In relation to environmental quality regulation, it is left to the Member States to safeguard concerns regarding copper- or zinc-based paints (EU only addresses TBT, diuron and irgarol). Even as regards the biocidal products regulation, it appears that Member States are still left with some room for application of national criteria, e.g. linked to environmental protection concerns.

Clear national limit values for relevant antifouling substances, complementing the EU values for priority substances, are a necessary first step to get authorities, operators like marinas and boat clubs to act. Given the nature of antifouling issues, i.e. the need to address the behaviour of boat owners and the lack of appropriate supervision and enforcement of public law requirements, it could be argued that private law arrangements, e.g. codes of conduct, are a suitable complement to public law requirements. In this context, internal environmental codes of

conduct in marinas could, in different and innovative ways, hold a key position in influencing environmentally friendly antifouling practices. To promote such development, a more active

and clear guidance from presumably national authorities to the marinas and boat clubs as well as local supervising authorities would be appropriate.