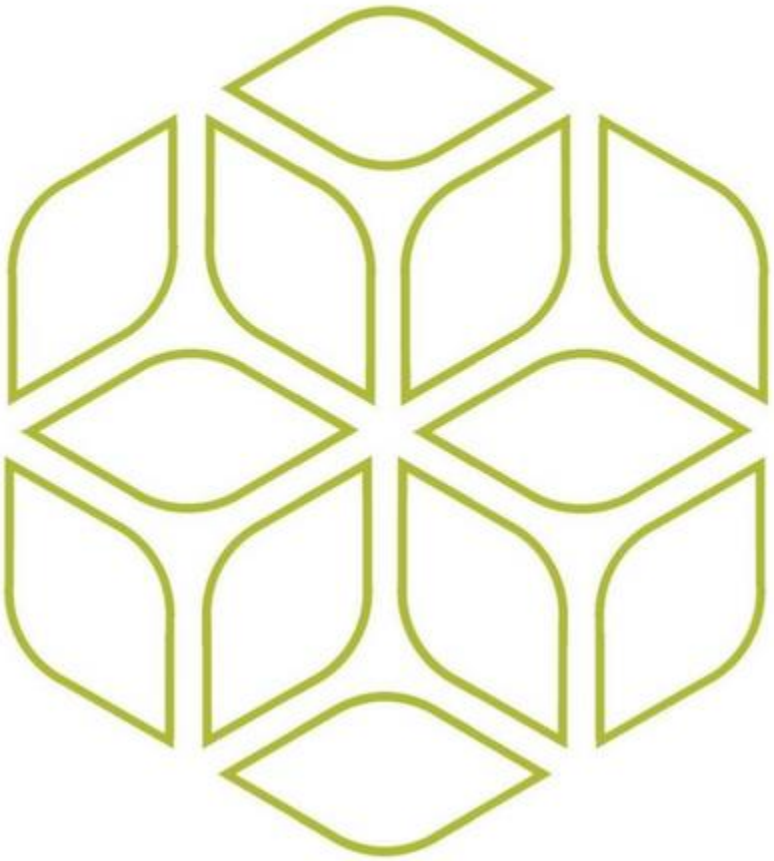

End-of-Life Recreational Vessels

Work Package 2

Final Report

Defra

March 2023

resourcefutures

Document prepared for

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Version Control

File name	5753-RecreationalVessels-WP2_FINAL
Version	1
Date	24/03/2023
Client contract no.	MRD321
RF contract no.	5753

Acknowledgments

We would like to thank the stakeholders that participated in the workshop. They provided essential insight and data for this project. Stakeholders engaged in this project have remained anonymous, but they represent government, trade associations, waste managers and ports and marinas in Sweden, Denmark, Belgium, Portugal, UK, and Europe.

Limitations

This report has been produced by Resource Futures on behalf of Defra. Whilst Resource Futures has taken all due care to interpret and collate the information presented within the report, any third party relying on the results of the analysis shall do so at their own risk and neither Resource Futures nor Defra shall be liable for any loss or damages arising there from.

Executive Summary

Improper waste management of end-of-life recreational vessels can lead to their abandonment in coastal areas. This source of marine litter causes environmental harm through the leakage of hazardous chemicals, macrolitter and microplastics. This report is the second of two work packages which aim to progress the UK's commitment to lead action B.2.1 of the OSPAR Regional Action Plan on Marine Litter.[1] Work package one explored recreational vessel abandonment in the UK. The objectives of work package two were to:

- Identify estimates of recreational vessels in each OSPAR nation;
- Develop a methodology to quantify the number of recreational vessels in use and coming to the end of their life across the OSPAR Maritime Area;
- Understand vessel management across the OSPAR Maritime Area; and
- Identify policy options to support waste management of end-of-life recreational vessels.

Desk-based research and a workshop with representatives from the OSPAR Maritime Area were conducted to inform this work.

Estimates on the number of recreational vessels and those which are at the end of their life or have been abandoned were limited. Data available in the public domain were often dated, making it difficult to understand the scale of the problem. Available data shows there could be as many as 5 million recreational vessels in the OSPAR Maritime region. Estimates in the public domain on the number of recreational vessels coming to the end of their life annually ranges from 1%[2] to 10%[3], however, stakeholders engaged in this project said that in their experience it is lower than 1%. There is also extremely limited data on the number of abandoned vessels in the OSPAR Maritime Region. A high level methodology for establishing a baseline on the number of recreational vessels in use and the materials requiring waste management annually is proposed within the report.

Typically, at the end of a vessel's life, a third party will strip the vessel of contaminants and break the boat down into its individual components, which will be reused, recycled, incinerated, or sent to landfill. Most vessels are made of glass reinforced plastic (GRP) which is possible to recycle, but there are many challenges with doing this and as a result the majority of vessels are incinerated or sent to landfill.

The challenges associated with waste management of end-of-life vessels include cost, lack of knowledge on waste management routes by vessel owners, insufficient infrastructure for recycling and difficulty in identifying owners of abandoned vessels. The extent to which these challenges are faced in the OSPAR Maritime Area vary by nation as some have more infrastructure and guidance than others. The cost of waste management appears to be the biggest contributor leading to abandonment across the OSPAR Maritime Area. Even in areas where funding schemes are in place, the transportation cost is a huge barrier. There are also few deterrents in place for those who

[1] OSPAR (2022) *OSPAR Regional Action Plan on Marine Litter* [accessed 2 February 2023]
[2] European Boating Industry (unknown) *Circular economy* [accessed 5 February 2023]
[3] Norwegian Environment Agency (2014) End-of-life boats (ELB) in Norway, environmental survey

choose to abandon vessels as it can be difficult to find the owners and bring any enforcement action.

There are some measures in place across the OSPAR Maritime Area to help address the problem. This includes:

- Extended producer responsibility;
- Funded waste management; and
- Mandatory register of recreational vessels.

Due to the lack of baseline data on the number of vessels reaching the end of their life, it is not possible to quantify the impact these policies have had on the abandonment of vessels. Anecdotal feedback from some stakeholders has been that these schemes have seen successful uptake, which ensures that many vessels are being recycled.

Five policy options were developed for work package one based on a review of policies and activities in other countries, and options put forward by stakeholders during interviews. These were:

1. Option 1: Extended Producer Responsibility
2. Option 2: Mandatory Registration of Vessels
3. Option 3: Public Funding for End-of-Life Vessels
4. Option 4: Establishing National Guidance on Waste Management of End-of-Life Vessels
5. Option 5: Circular Design

These options were also put forward to representatives of the OSPAR contracting parties who attended the workshop. In the workshop, participants were asked whether they thought these options would address the challenges associated with end-of-life recreational vessels, how to maximise success, and the potential risks. Participants were then asked to vote on their two preferred options. Whilst all the policies could address the barriers identified, mandatory registration of recreational vessels, which would help to identify recreational vessel owners and deter abandonment, received the most votes as the preferred option. This was followed by Extended Producer Responsibility, which would help to fund waste management of vessels and ensure producers were contributing to this cost. Development of national guidance on waste management was the least popular option, only receiving one vote.

The findings from the workshop identified additional measures that could be taken to address the issue. This included:

- Spreading the cost of waste management throughout the vessel's life;
- Reducing cost of transport;
- Developing a waste management strategy;
- Development of a methodology to monitor end-of-life vessels; and
- Allowing end-of-life vessels to be dismantled on site where they are abandoned (e.g. in harbours), through permit exemptions.

Findings from this research indicated that no single policy measure is likely to address all of the challenges associated with waste management of end-of-life recreational vessels. Due to limited

data, it is not possible to understand the scale of vessels coming to the end of their life and those being abandoned. Establishing a baseline on the number of vessels in use would help to better understand and design policies which can make an impact on the issue. OSPAR could play a role in developing a methodology and best practice guidance to ensure consistency. OSPAR could also play a role in coordinating the development and implementation of any policy measures. This could allow the sharing of resources to ensure the problem is addressed across the region and avoid any border issues or market distortion across nations.

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Acronyms

EPR	-	Extended producer responsibility
GRP	-	A composite material consisting of a polymer that is reinforced with glass fibres s, commonly known as Fibreglass
RIB	-	Rigid inflatable boat
SwAM	-	Swedish Agency for Marine and Water Management

Glossary

Abandoned vessel	Any vessel that has been left by an owner with no intention to return to or use it. This includes vessels that have been left in estuaries, on land, and in ports.
Circular design	Design that is made to maximise resource efficiency throughout the vessel life cycle from manufacturing to end-of-life, by eliminating waste and maximising reuse.
End-of-life vessel	A vessel which is at the end of its operational life and no longer seaworthy (excludes vessels which have been converted to other uses such as bars).
Recreational vessel	It should be noted that each contracting party may have a different definition for recreational vessel. For the purpose of this project, the definition of a pleasure vessel according to the Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations 1998 (SI1998/2771) is used: *"(a) any vessel which at the time it is being used is:* *(i)* *(aa) in the case of a vessel wholly owned by an individual or individuals, used only for the sport or pleasure of the owner or the immediate family or friends of the owner; or* *(bb) in the case of a vessel owned by a body corporate, used only for sport or pleasure and on which the persons on board are employees or officers of the body corporate, or their immediate family or friends; and* *(ii) on a voyage or excursion which is one for which the owner does not receive money for or in*

connection with operating the vessel or carrying any person, other than as a contribution to the direct expenses of the operation of the vessel incurred during the voyage or excursion; or

(b) any vessel wholly owned by or on behalf of a members' club formed for the purpose of sport or pleasure which, at the time it is being used, is used only for the sport or pleasure of members of that club or their immediate family, and for the use of which any charges levied are paid into club funds and applied for the general use of the club; and

(c) in the case of any vessel referred to in paragraphs (a) or (b) above no other payments are made by or on behalf of users of the vessel, other than by the owner."[4]

[4] RYA (2019) *Pleasure vessels and the UK Merchant Shipping Regulations [accessed 5 December 2022]*

1 Introduction

End-of-life recreational vessels are known to be a source of marine litter when they are abandoned. To further understand this issue, a series of two work packages has been completed. Work package one focused on end-of-life recreational vessels and vessel abandonment in the UK. Work package two builds on this report to understand the wider context of end-of-life recreational vessels and vessel abandonment across the OSPAR Maritime Area. Along with the report produced focusing on the UK, this work will progress the UK's commitment to lead action B.2.1 of the OSPAR Regional Action Plan on Marine Litter.

End-of-life recreational vessels and vessel abandonment is an issue not just along the UK coastline, but all coastlines where there are recreational boating activities. Due to the cross-border nature of boating, this report aims to bring together existing waste management practices and policies across the OSPAR Maritime Area to identify possible solutions that could be coordinated by OSPAR to tackle abandonment. To achieve this, this report aims to:

- Identify estimates of recreational vessels in each OSPAR nation;
- Develop a methodology to quantify the number of recreational vessels across the OSPAR Maritime Area;
- Understand vessel management across the OSPAR Maritime Area; and
- Identify policy options to support waste management of end-of-life recreational vessels.

This report focuses on boating within the maritime region, therefore, only the OSPAR contracting parties with a coastline are included to tie together cross border findings and policy options on a large scale to tackle this issue. There are 15 countries within the OSPAR areas: Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom. As Switzerland and Luxembourg do not have a coastline, we have deemed these two countries to be out of scope for this project.

2 Methodology

2.1 Desk-based research

The literature review used desk-based research to identify information in the public domain on recreational vessel numbers, type of recreational vessels, end-of-life management options, barriers and challenges to responsible management and existing measures in each of the OSPAR regions with coastal areas The presence or absence of a mandatory registration system was also researched. This is where recreational vessels must be registered by the owner. Sources included:

- Government websites to understand current regulatory frameworks and measures in place to address the issue;
- News articles, predominately in boating journals, to further understand issues with vessels at the end of their life;
- Previous research on the subject;

- Trade Association documents including policy positions and guidance to members;
- Boat dismantlers and breakers websites; and
- Manufacturers, boat brokers and second-hand trading websites to collect data on vessel profiles.

This research was used to inform the stakeholder engagement activities to ensure they would address gaps and corroborate findings from the literature.

2.2 Stakeholder engagement

One stakeholder workshop was held online, with the objective of exploring the scale of the problem across the OSPAR region, what is currently happening to tackle the issue of abandoned vessels and policy options to tackle this issue. Representatives from each of the contracting nations were invited to attend the workshop. In total, there were 14 attendees representing government and industry in:

- Sweden
- Denmark
- Belgium
- Portugal
- United Kingdom
- European Boating Association
- OSPAR Regional Action Plan Coordinating Team

The workshop was an interactive session using Miro[5] and MS Teams as facilitation tools. Miro is an interactive whiteboard tool, which enables participants to add their thoughts on each topic using sticky notes and comments, and vote for options using moveable dots.

The workshop was broken down into four main sections, in addition to introductions and close-down. These focused on:

- **The scale of the problem:** Attendees added sticky notes to the Miro board with their thoughts on financial and environmental impacts of abandoned vessels, vessel types most likely to be abandoned, and estimates on the number of abandoned vessels in OSPAR regions.
- **Barriers to responsible waste management:** The findings from work package one were presented and attendees were asked to vote on whether they agreed or disagreed with these barriers. They were also asked if there were any further barriers that had not been identified in work package one.
- **Tackling the problem**: Attendees placed comments on maps of Europe to show where schemes are in place to manage end-of-life vessels and prevent abandonment.
- **Future options:** Attendees were presented with the list of impact categories that were used in work package one (see Appendix A). Attendees were presented with a potential future

[5] https://miro.com/

policy option (Extended Producer Responsibility (EPR), mandatory registration, circular design, public funding for waste management and circular design). After each option was presented, participants were asked to comment on factors needed for success, potential impacts, risks, and feasibility of each option, by adding sticky notes to the Miro board. Attendees were asked if there were any other suitable policy options that had not been explored. Finally, participants were asked to vote for their preferred future options.

The findings from the workshops were used to supplement the information from the literature review and to develop possible future policy options across OSPAR.

3 Findings

3.1 Data on recreational vessels in OSPAR regions

3.1.1 Limitations

There is no standardised data being collected in the OSPAR Maritime Area on the number of recreational vessels, end-of-life vessels, or abandoned vessels. Therefore, the methodology in data collection and definitions of recreational vessels vary between the different contracting parties. This needs to be considered when interpreting data as numbers will not be directly comparable. Furthermore, much of the data in the public domain is historic and may not be an accurate picture of the current situation.

3.1.2 Number of recreational vessels

There are estimates in the public domain that there were approximately 6 million recreational vessels in Europe in 2016.[6] The number may be far higher, with other data indicating that there could be approximately 5 million recreational vessels in the OSPAR regions alone (Table 1). However, estimates from some regions are over 20 years old. Some countries, such as Spain, have reported that there has been a decrease in boat ownership since the financial crash in 2008.[7] In 2021, Spain saw the largest increase in vessel registration since the crash, with a total of 7,178 new registrations.[8]

Scandinavia has some of the highest boat ownership in Europe, with estimates that Finland and Sweden are among the top four nations for ownership of recreational vessels globally.[9] According to a survey conducted by the Swedish Department of Transport, 16% of households in Sweden have at least one leisure boat.[10]

Data on the types of vessels within each nation were also very limited with most of this information in an ICOMIA report from 2017.[11] Available data shows that motorboat ownership is more common than sailboats in Scandinavia. In countries further south, such as Spain and the Netherlands, sailboats make up a higher percentage of vessel ownership.

[6] European Commission (2017) *Assessment of the impact of business development improvements around nautical tourism*
[7] Martinez-Vazquez R. M., Milan-Garcia J., Valenciano J. D. (2022) *Challenges and opportunities for the future of recreational boat scrapping: The Spanish Case* Marine Pollution Bulletin 178
[8] Martinez-Vazquez R. M., Milan-Garcia J., Valenciano J. D. (2022) *Challenges and opportunities for the future of recreational boat scrapping: The Spanish Case* Marine Pollution Bulletin 178
[9] Marine project (undated) *Spain boat registrations boom in 2021* [accessed 7 February 2023]
[10] Swedish Transport Department (2021) *The boating survey*
[11] ICOMIA (2017) *Recreational boating industry statistics*

Table 1 Number of recreational vessels in OSPAR regions, ordered from highest to smallest. Unless otherwise specified, data does not differentiate between coastal and inland vessels.

Country	Year	Number of recreational vessels	Types of recreational vessels	Mandatory Registration
Finland	2017	1,157,500[12]	Data unavailable	No
France[13]	2021	1,049,340	- 78% motorboats; - 21% sailboats; and - 1% other.	Yes
Sweden	2020	864,200[14]	According to 2017 data[15]: - 11% inboard motorboats; - 9% sailboats; - 1% inflatable boats; and - 79% other rigid boats.	Yes – for vessels over 15m
Norway	2023	1 million[16]	- 26% inboard motorboats; - 7% sailboats; - 14% inflatable boats; and - 53% other rigid boats.	Yes – for vessels over 15m
Germany	2004	800,000[17]	Data unavailable	Yes – for vessels over 15m
Ireland	2004	<600,000[18,19]	Data unavailable	No
The Netherlands[20]	2017	502,000	- 28% inboard motorboats; - 37% sailboats; and - 35% other rigid boats.	No
Belgium	2004	300,000[21]	Data unavailable	No
Spain	2017	200,000[22]	- 26% inboard motorboats; - 44% sailboats; - 6% Inflatable boats; and - 24% other rigid boats.	Yes
Portugal	2004	<200,000[23,24]	Data Unavailable	Yes
Denmark	2019	53,000[25]	Data unavailable	Yes – for vessels over 15m
Iceland[26]	2018[27]	2,300[28]	Data unavailable	Yes

[12] ICOMIA (2017) *Recreational boating industry statistics*
[13] French Ministry of the Sea (2021) *La Plaisance en chiffres*
[14] Swedish Transport Department (2021) *The boating survey*
[15] ICOMIA (2017) *Recreational boating industry statistics*

3.1.3 Number of end-of-life vessels

Whilst quantitative data on the number of recreational vessels at the end of their life was not available for most regions, desk-based research indicated regions will be facing similar challenges with end-of-life vessels. Vessels made of GRP increased in the 70s and 80s, and many of these will now be reaching the end of their seaworthy life.[29] In the 1980s Norway had the highest level of recreational boat ownership, followed by Finland and Sweden, which could mean that these regions face the largest challenges with end-of-life waste management.[30]

Studies which have estimated the number of end-of-life vessels have been published in previous years, but more recent estimates were not found. According to a 2016 study, 1-2% (approximately 60,000-120,000) of recreational vessels in Europe are at the end of their life. Stakeholders in the workshop said that in their experience this is probably an overestimate, and it is probably closer to 30,000 – 40,000. This view was shared among multiple participants.

Research conducted in 2015 in the Netherlands estimated that approximately 2.5% of Dutch recreational vessels would require dismantling between 2015 and 2020 (approximately 12,500 vessels) and this would increase to 7.5% (approximately 35,000 vessels) between 2025 and 2030.[31] If this estimate is accurate, then other regions may also see an increase in vessels at the end of their life in the coming five years. A survey by the Norwegian Environment Agency in 2012, indicated that 10% of boat owners were considering disposing of at least one vessel.[32] This same study estimated that in 2030, approximately 3% of vessels (approximately 23,000) would be at the end of their life.

Whilst there is no evidence to confirm these estimates, data from countries with programmes in place to assist with the waste management of end-of-life recreational vessels provide an indication that the number of recreational vessels requiring waste management is a small percentage of the total fleet. However, these numbers are likely to grow in the coming years. For example, the

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[16] The Local Norway (2023) *Norway is considering making small boat registration mandatory*
[17] British waterways Scotland (undated) *Recreational boating in Scotland* [accessed 8 February 2023]
[18] British waterways Scotland (undated) *Recreational boating in Scotland* [accessed 8 February 2023]
[19] Estimate for UK and Ireland
[20] ICOMIA (2017) *Recreational boating industry statistics*
[21] British waterways Scotland (undated) *Recreational boating in Scotland* [accessed 8 February 2023]
[22] British waterways Scotland (undated) *Recreational boating in Scotland* [accessed 8 February 2023]
[23] British waterways Scotland (undated) *Recreational boating in Scotland* [accessed 8 February 2023]
[24] Estimate for Spain and Portugal
[25] Baltic Sea Cruising Network (2019) *Useful information if going to Denmark as a tourist in a pleasure craft*
[26] Data on from Iceland includes recreational and commercial vessels.
[27] MARPART (2018) *Maritime activity in the high North – current and estimated level up to 2025*
[28] Icelandic Transport Authority (unknown) *Ships and cargoes* [accessed 13 February 2023]
[29] ICOMIA (2017) *Recreational boating industry statistics*
[30] ICOMIA (2017) *Recreational boating industry statistics*
[31] WA Yachting Consultants (2015) *Number of end of life boats (ELB) and waste material flows in the Netherlands*
[32] Norwegian Environment Agency (2014) End-of-life boats (ELB) in Norway, environmental survey

Swedish Agency for Marine and Water Management (SwAM) collected 500 end-of-life boats in 2020[33] (approximately <0.1% of the fleet), but estimate that there are 62,000 non-seaworthy vessels (approximately 7% of the fleet) in Sweden. In France, 1,200 vessels (approximately 1% of fleet) were dismantled between September 2019 and end of November 2020.[34]

3.1.4 Number of abandoned vessels

Information on the number of abandoned vessels was not available for most of the countries in scope for this project. Existing estimates are as follows:

- 2,000 abandoned vessels in Sweden.[35] This estimate suggests that around 0.24% of recreational vessels in Sweden are abandoned.
- 25,000 abandoned vessels in Dutch harbours and marinas in 2013[36]; This would indicate that around 5% of recreational vessels are abandoned in the Netherlands.
- 10,000 vessels abandoned in marinas in Spain in 2013, with an additional 750-1,000 thought to be abandoned annually.[37] This would indicate that 5% of vessels are abandoned in Spain.

SwAM is in the process of mapping abandoned vessels in Sweden and will be reporting on this in the autumn of 2023. SwAM has appointed consultancy Ecoloop AB, to carry out this work, including mapping the problem from a life-cycle perspective and recommended measures to increase recycling.[38]

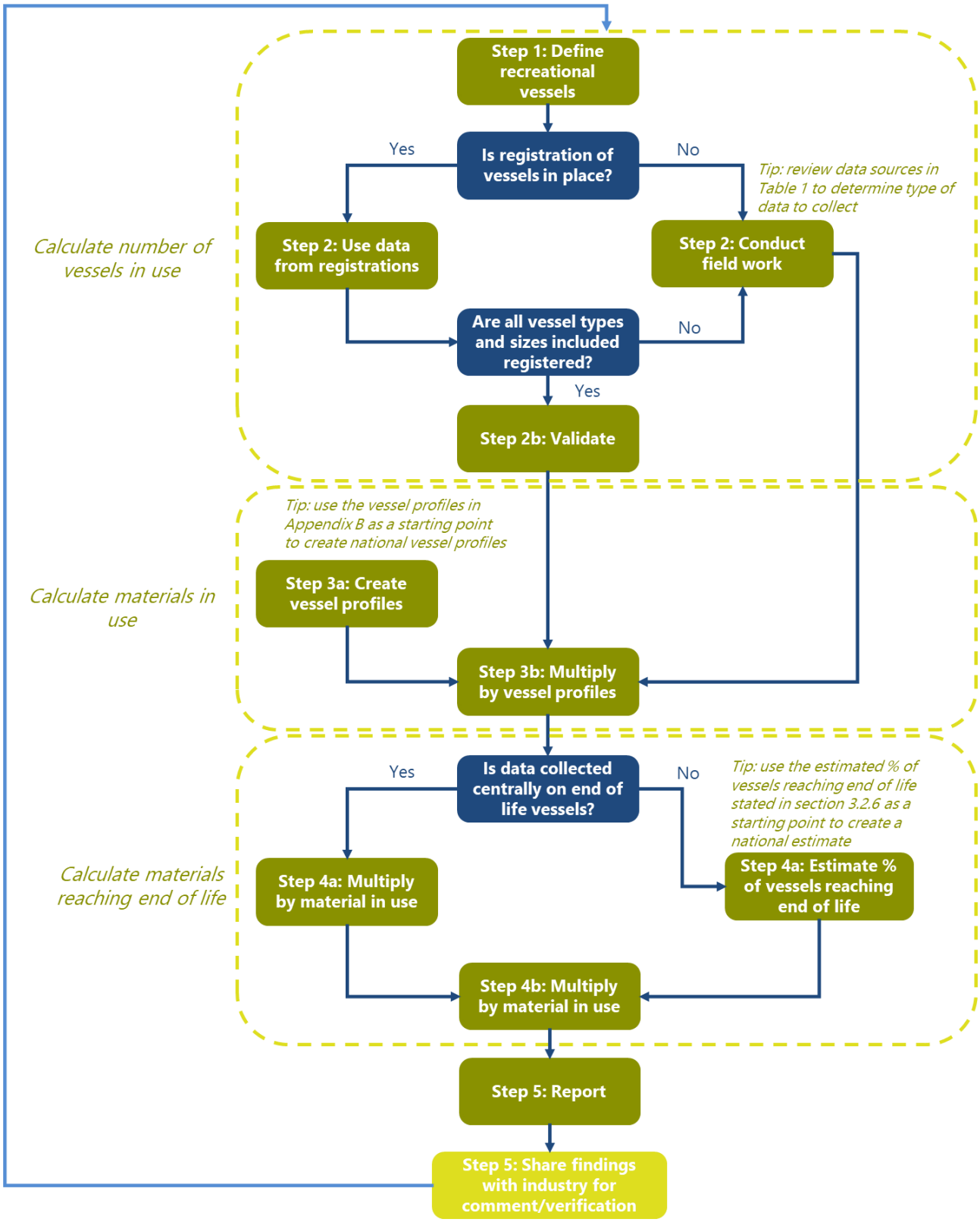
It is unclear which types of vessels are in scope for these estimates. In particular, the estimate of abandoned vessels in the Netherlands is very high. As it is not clear what is in scope or how the estimate was calculated, it should be treated with caution.

3.2 Methodology to quantify recreational vessels in OSPAR regions

There is currently no standardised methodology for quantifying the number of recreational vessels in any of the OSPAR nations. A consistent and agreed approach would help to better understand the number of vessels coming to the end of their life and inform the development of proportionate policy measures. A coordinated methodology across OSPAR contracting parties would enable comparison and facilitate coordinated policies for the waste management of end-of-life recreational vessels. A summary of a high level methodology to estimate recreational vessel numbers, materials in use in recreational vessels, and materials reaching end-of-life annually can be seen in **Error! Reference source not found.**.

[33] Swedish Agency for Marine and Water Management (2022) *Government assignment on the collection and Recycling of fishing gear and recreational boats*
[34] European Boating Industry (2020) *Meeting of stakeholder working group for end-of-life recreational boats*
[35] Barche a Motore (2022) *Scrapping the boat? In Italy it's a mess, in Sweden it's free.*
[36] Dutch News (2013) *Abandoned boats are latest Dutch environmental problem*
[37] Euro Weekly News (2014) *10,000 boats abandoned in Spanish Marinas*
[38] Swedish Agency for Marine and Water Management (2022) *Government assignment on the collection and Recycling of fishing gear and recreational boats*

Figure 1: Quantification methodology outline



3.2.1 Agreeing a definition

The first step needed is to define the term "recreational vessels" and which types of vessels are in scope. An agreed definition across the OSPAR Maritime Area will help enable comparison of figures. For the purpose of this project, the UK's legal definition of a pleasure vessel was used. Vessels included in the scope were:

- Sailing boats/yachts;
- Power boats;
- Motorboats;
- Rowing boats; and
- Sports boats and rigid inflatable boats (RIBS).

Desk-based research showed that current figures included other vessels, such as canal boats, personal watercrafts, canoes, and kayaks. The inconsistency in definition makes it difficult to compare figures. Stakeholders in the workshop also raised the lack of consistent definition of abandoned vessels as an issue; this will depend on regulatory mechanisms that are in place in each nation. For example, in Sweden a vessel which has been wrecked or has sunk is not classed as abandoned and the owner is not required to organise its removal.[39] However, this will still be a source of marine litter and environmental pollution.

3.2.2 Using registration data

In countries where vessels are registered (either voluntary or mandatory), the register can provide data on the number of vessels. If mandatory registration is in place for all vessel types, then this may provide a reliable number of recreational vessels and their age.

However, it should be noted that challenges do exist in ensuring that all vessels are registered (see sections 3.5.4 and 3.6.2 for further discussions on these challenges). Mandatory registration has been in place in France since 2016, however since EPR was introduced, it is thought that approximately 20% of recreational vessels were not registered.[40] Therefore, fieldwork may be required initially to understand the coverage of the registry data.

In cases where registration is not mandatory or not all vessel types and sizes are included, then field work will be needed to supplement this data to ensure a high-quality dataset.

3.2.3 Field work

In the absence of registration data, field work will need to be conducted to create a baseline on the number of recreational vessels. This could be done by:

- Visiting or surveying a representative sample of harbours, ports, and marinas across the nation to count the number of vessels present and then scale up by number of such sites in the country; and

[39] According to a participant in the workshop

[40] EBA (2022) *EBA Position Statement: Boat Registration*

- Surveys of recreational vessel owners to understand the proportion of vessels stored elsewhere.

Alternately, surveys could be undertaken using a representative sample of the population across a nation as occurs in the UK[41] and Sweden[42]. In these nations, surveys are conducted regularly to provide time-series data on boating habits and boats in use. The surveys are answered regardless of whether a boat is owned by the respondent. The survey should be designed to collect data (e.g. municipality or postcode) to enable understanding of geographical spread of boat ownership and use. Always ensuring a representative sample, the number of people surveyed should also be large enough to provide robust results, particularly if looking to provide breakdowns by region. Once multiple years of data are available, it may be advisable to report on rolling averages, which may smooth discrepancies resulting from small sample sizes or other issues.

When planning primary data collection, it is advisable to consider the data already being collected by other nations. Reviewing the sources outlined in Table 1 is recommended.

In the absence of data on the number of new vessels entering the country and those reaching the end of their life each year, this will need to be repeated annually (or at another agreed interval).

3.2.4 Validate

Once data have been collected, it is advisable to run a validation process. This will help to understand the coverage and accuracy of the data. In work package one, data on vessel numbers collected in the UK based on a survey were found to be an overestimate relative to population size, when compared to other sources[43]. This difference is likely the result of a change in methodology from in person to online data collection. It is therefore important to understand the limitations of the methodology chosen. This validation step could involve:

- Seeking feedback from industry experts to corroborate the estimates (this could also be an opportunity to gain an understanding of geographical spread of vessels);
- Calculating per capita vessel ownership figures; or
- Comparing against other nations, accounting for difference in size, coastline length etc.

3.2.5 Calculate materials in use

In work package one, vessel profiles were developed based on expert views of key stakeholders. These have been included in Appendix B. These are high level estimates of typical vessel profiles for the vessel categories for which data is collected in the UK. These should not be automatically transferred for use in other nations, but instead should be used to engage Trade Associations, Boat Salvage / Breakers, Boat Sales / Brokers, and Shipyard / Boatbuilders. They should be asked to

[41] British Marine, 2023. Boating and Watersports Participation [accessed 14 March 2023]
[42] Transport Styrelsen, 2021. Båtlivsundersökningen 2020: Fler vill ha ordning och reda på sjön [accessed 14 March 2023]
[43] European Boating Association, 2020. EBA Position Statement End of Lifeboats. https://eba.eu.com/wp-content/uploads/site-documents/eba-position-statements/eba-position-elb.pdf

comment on the profiles transferability, and should be encouraged to make adjustments as necessary.

Once vessel profiles have been verified, the number of vessels can be multiplied by the vessel profiles to determine the weight of material in use.

3.2.6 Calculate materials reaching end-of-life annually

Figures for vessels reaching end-of-life annually in Europe, and vessels dismantled annually in Europe and France were gathered during work package one. These figures estimate that between 0.1% and 2.2% of vessels are reaching their end of life each year. When combined with the estimates of abandoned vessels outlined in section 3.1.4, these figures provide a starting point to engage key stakeholders on the proportion of vessels reaching end-of-life annually in that nation. Alternately, if data are already available from nationwide dismantling programmes, this should be used.

These figures can then be used to multiply the material in use figures to estimate annual waste arisings.

3.2.7 Share findings

The results of this quantification exercise should be shared with industry for comment and verification. This will enable higher quality data to be collected during the following iteration.

3.3 Waste management of end-of-life vessels

The waste management options available throughout the OSPAR regions are similar to those outlined in the work package one report for the UK. Boat owners are responsible for managing the waste at the end of the vessel's life. This typically involves the owner using a third party, which will strip the vessel of contaminants, remove all fittings and fixtures, and breakdown the vessel to its individual components.[44] Depending on the material of these components, they will be reused, recycled, incinerated, or sent to landfill. Many countries, such as Sweden, Netherlands, Norway, Denmark, Spain, and France have an established network of companies or boat breakers which owners can send their vessels to.[45,46,47]

In Spain, this process is slightly different.[48] First, the owner of the vessel must make a scrapping request to the harbour master, who is responsible for enforcing any regulations in a particular harbour or port and pay a fee for the scrapping and deregistering of the vessel. When they do this,

[44] *Above The Brine (accessed November 2022) Boat disposal and recycling services* [accessed 28 November 2022]

[45] Båtretur (undated) Båtretur – Båtlivet's network for disposal of end-of-life leisure boats [accessed 5 January 2023]

[46] EBA (Undated) *Future of yacht recycling point to solutions with end-of-life boats*

[47] Professional Boatbuilder (2021) *Fibreglass Disposal 2: Vanishing acts*

[48] Martinez-Vazquez R. M., Milan-Garcia J., Valenciano J. D. (2022) *Challenges and opportunities for the future of recreational boat scrapping: The Spanish Case* Marine Pollution Bulletin 178

they must specify which authorised boat breakers will carry this out. Once this is authorised, the process will be monitored to ensure all hazardous materials are removed and proper waste carriers have been used.

Whilst GRP can be recycled, there are many challenges associated with this which result in a lot of GRP being sent to landfill or incinerated. Germany has banned GRP being sent to landfill, which results in most material being incinerated.[49] Norway has a GRP recycling facility, which accepts and successfully recycles vessels. They produce two grades of recycled GRP; a higher grade which is made from high quality GRP and a lower grade that is made from GRP contaminated with traces of paint or other materials such as rubber, plastic, and wood.[50] The waste companies can apply for up to 6 NOK (50p) per kilo to recycle.[51]

3.4 Barriers to waste management of recreational vessels

The challenges and barriers that lead to abandonment of recreational vessels identified in work package one: cost, lack of knowledge, insufficient infrastructure and difficulty in identifying owners, were the same in OSPAR regions. The participants of the workshop were asked if they agreed with these as barriers and most did. There was one exception, with stakeholders saying that infrastructure for waste management of recreational vessels in Sweden was sufficient (see section 3.5 for more detail).

The cost of disposing of a vessel at the end of its life is the biggest barrier to proper waste management.[52] One report has stated that the costs are fairly uniform across Europe, however there are some schemes in place that reduce this cost for owners (see section 3.5 for more details).[53] The same report outlined that approximately 10% of quotes for dismantling end-of-life boats will be taken up. The costs of transporting the vessel to the proper waste management facility is a large part of this cost. In areas where there is not a sufficient network of dismantlers, the transport fees can account for as much as 30% of the total costs.[54]

The cost of transport was brought up repeatedly in the workshop by stakeholders, highlighting how significant this barrier is. Stakeholders in the workshop also discussed legislative barriers to dismantling vessels on site (e.g. in harbours) as being allowed to do so could help to decrease transport costs.

The aging demographics of recreational vessel owners was raised as a barrier in work package one as vessel owners may have difficulty in managing their vessels or finishing a restoration project. The literature suggests this may also be a problem in other nations; in the Netherlands, for example,

[49] Professional Boatbuilder (2021) *Fibreglass Disposal 2: Vanishing acts*
[50] Professional Boatbuilder (2021) *Fibreglass Disposal 2: Vanishing acts*
[51] Milijø-direcktorater (undated) *Reception of scrapped leisure boats* [accessed 13 February 2023]
[52] Martinez-Vazquez R. M., Milan-Garcia J., Valenciano J. D. (2022) *Challenges and opportunities for the future of recreational boat scrapping: The Spanish Case* Marine Pollution Bulletin 178
[53] EBA (Undated) *Future of yacht recycling point to solutions with end-of-life boats*
[54] EBA (Undated) *Future of yacht recycling point to solutions with end-of-life boats*

the age profile of recreational vessels is also increasing. In 1993, 35% of boat owners were over 50 and in 2013, this increased to 74%.[55] Stakeholders working in marinas spoke of issues where they are left to deal with end-of-life vessels when an owner dies, and they are not able to locate anyone else to take ownership.

Stakeholders in both work packages said that often the last owner of a vessel does not have sufficient knowledge of end-of-life management, nor are they aware of the associated costs.[56] As they are often the owners with the least money, there are challenges in affording this process, which may lead to abandonment. Sweden is in the process of developing national guidance to address this problem and have said that this guidance will be available in 2023.[57]

3.5 Existing measures in OSPAR nations to address recreational vessels

3.5.1 Extended producer responsibility

EPR is a policy based on the polluter pays principle, designed to decrease the total environmental impact of a product, by making the producers of the product responsible for the entire life cycle of the product and especially for the take-back, recycling and final disposal. In many instances this makes producers financially responsible for managing their products at end-of-life. France has established an EPR scheme for recreational vessels.[58] This is a mandatory compliance scheme for recreational vessels between 2.5 and 24 meters in length.[59] A small levy is paid by companies into a central fund for safe disposal when a boat is sold. Currently, the scheme finances a network of 26 dismantling centres, which break down and dispose of vessels at the end of their life.[60] It also finances 80% of the transport cost of boats under 6m in length.[61] Between September 2019 and end of November 2020, 1,200 boats were dismantled.[62]

3.5.2 Annual tax on recreational vessels

In Portugal, all recreational vessels must be registered, and the owner has to pay an annual tax.[63] The annual tax, known as *circulation tax*, is essentially a road tax that is also applied to recreational yachts and motorboats, which are in Portugal for at least 183 days per calendar year. Vessels which were registered before 1986 or with an engine power less than 20kw are exempt.[64] The rate of this

[55] WA Yachting Consultants (2015) *Number of end of life boats (ELB) and waste material flows in the Netherlands*
[56] Views shared by stakeholders in work package 2 workshop.
[57] Shared by stakeholders in the workshop
[58] APER (undated) *Network of dismantling recreation craft in France* [accessed 23 December 2022]
[59] Diaz I. M, (2021) *Pleasure boats at the end of their life: where is the dismantling sector?* Voiles et voiliers
[60] APER (undated) *Network of dismantling recreation craft in France* [accessed 23 December 2022]
[61] Carbon Trust (2022) *Roadmap for the decarbonisation of the European Recreational Marine Craft Sector.*
[62] European Boating Industry (2020) *Meeting of stakeholder working group for end-of-life recreational boats*
[63] Angloinfo (undated) *Sailing and boating in Portugal* [accessed 7 February 2023]
[64] Yachting Monthly (2010) *Portuguese yacht tax explained*

tax is scaled to engine power and is 2.73 Euros per kw.[65] It is unclear what the money raised via this tax is used for and the impact it has on addressing issues associated with end-of-life recreational vessels. It has been included in this report as an example of a policy measure which could be developed to help fund the waste management of recreational vessels.

3.5.3 Government funded waste management schemes

In Scandinavia, there are a variety of government waste funded schemes. In Norway, this is through a government wreckage deposit of 1,000 NOK (approximately £80) which is paid to the owner when they arrange for their vessel to be recycled. [66] Vessels of all materials (wood, plastic, metal and GRP) are included in this scheme. As are rowboats, kayaks, canoes, dinghies, sailboats, RIBs and motorboats up to 15m. Vessels which are up to 4.57 and less than 1.1 tonnes can be delivered to the recycling facility for free.

In Sweden, SwAM has subsidised the waste management of recreational vessels since 2018, which successfully led to around 600 end-of-life vessels per year being handed in for recycling.[67] [68] There is also a national network for collection and recycling of recreational vessels, Båtretur, which has over 25 sites in Sweden. This network was established to prevent the abandonment of vessels. They provide a service which costs a maximum of 10,000SEK (approximately £800) to dispose of a vessel. If the scrappage costs the company more, the owner pays the difference. Boats which are between 3 and 12m and 200kg to 3 tonnes are eligible for this service.

Finland has piloted an amnesty scheme in 2005, whereby boat owners could leave any vessel <10m at collection points free of charge.[69] This was in place in the Turki Archipelago where many Fins have summer homes and there is a high density of recreational vessels. A total of 180 vessels were dropped off, some of which were sold for reuse. This was not continued, but there is a network of dismantling centres for GRP boats at the end of their life.[70]

3.5.4 Mandatory Registration

Mandatory registration of vessels could help to mitigate the challenges of locating the owner and exists in Spain, Finland, and France for all vessels. [71] In Sweden, Germany and Norway, vessels over

[65] The Portugal News (2021) *Do you need to pay tax on your foreign vehicle?*
[66] Ecofiber (undated) *Ecofiber Recycling* [accessed 13 February 2023]
[67] SwAM (2022) *Government Assignment on the Collection and Recycling of Fishing Gear and Recreational Boats*
[68] Mentioned by a Swedish boat breaker during the workshop, February 2023
[69] Norden (2013) *Disposal of plastic end-of-life-boats*
[70] Renegade Sailing (2018) *Breaking Up is Hard to Do*
[71] HELCOM (undated) *Policy brief: end-of-life boats* [accessed 5 January 2023]

15m must be registered.[72,73] Norway is considering making it mandatory to register all small recreational vessels[74]. In Denmark this is mandatory if the vessel weight more than 20 tonnes.[75]

3.5.5 Other Measures

In 2011, Spain changed the definition of abandoned vessels (302 of Royal Legislative Decree 2/2011 of 5 September) to make it easier for marinas and other authorities to deal with them more quickly. Vessels are considered abandoned when they have remained anchored, moored or on land for at least 3 months in the same place without having any type of activity. They must also not have paid relevant tariffs for at least 3 months.[76] After a vessel has been determined as abandoned it can either be sold to recover costs or sunk if required for safety reasons. However, in practice, these are often not able to be sold due to poor condition.[77]

3.6 Policy options

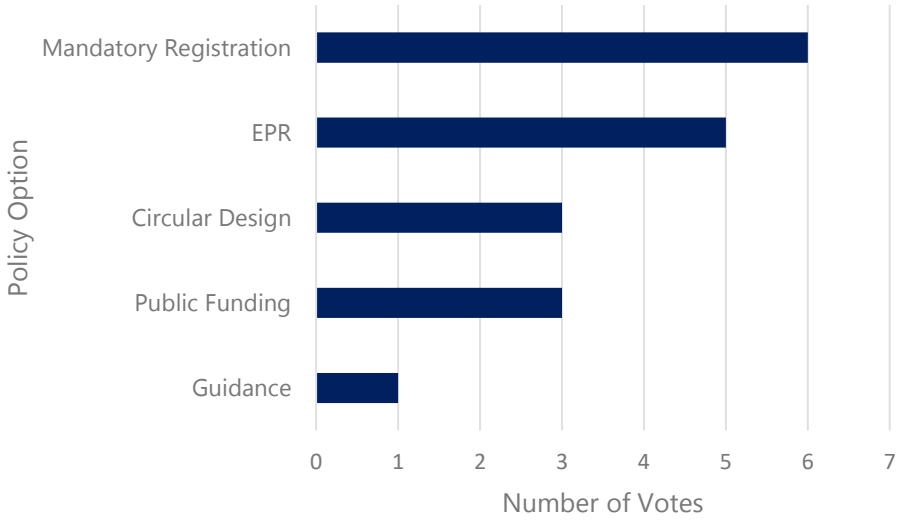
In the workshops, participants were asked to explore five future options to address end-of-life recreational vessels and prevent abandonment.

- EPR
- Mandatory registration
- Public funding for end-of-life management
- Best practice guidance
- Circular design

Participants were asked to explore each of these options and then vote on which of these were their top two preferences. EPR and mandatory registration received the most votes (see **Error! Reference source not found.**). Establishing guidance on best practice received the lowest number of votes.

[72] SwAM (2022) *Government assignment on the collection and recycling of fishing gear on recreational boats (2022)*
[73] German Federal Ministry for Digital and Transport (undated) *Recreational craft* [accessed 8 February 2023]
[74] *The Local (2023) Norway is considering making small boat registration mandatory*
[75] Danish maritime authority (undated) *Register a recreational craft* [accessed 8 February 2023]
[76] Aiyon Abogados (2022) *Abandonment of recreational craft*
[77] Aiyon Abogados (2022) *Abandonment of recreational craft*

Figure 2: Results by participants of two preferred policy options (n = 19 votes). One person voted for circular design and couldn't decide whether to place their second vote on EPR or public funding for waste management



3.6.1 Extended producer responsibility

EPR would help make the cost of waste management of end-of-life vessels more affordable to the final vessel owners. Stakeholders felt that EPR could be a viable option to prevent abandonment as it would be putting the cost onto the first owner who typically has the most money as newer boats are of higher value typically than second-hand vessels. Workshop participants spoke of their experiences in working on EPR for other products and said that in their experience early engagement and close collaboration with producers would be essential to making EPR for recreational vessels work. They thought that it would not only help to address the issue of vessels coming to the end of their life now, but it could also be used to incentivise more circular design practices.

Some stakeholders felt that for EPR to be successful and get producers on board, this would need to be dictated at an EU level (e.g. through an EU Directive). Others felt that this was disproportionate as many countries have very small fleets and do not face issues with abandoned vessels. Cross-border dismantling networks could be used to manage waste of vessels in countries with small fleets where it would not be financially viable to create their own networks. Stakeholders saw that there could be potential in OSPAR coordinating policy in this area. Additionally, there would need to be better data on the number of recreational vessels being produced and coming to the end-of-their life each year to be able to develop a feasible EPR study. This could be an opportunity for OSPAR to develop a consistent methodology and reporting across contracting nations.

Despite this policy option being favoured, stakeholders in the workshop raised several concerns and risks that would need to be addressed. This included:

- **New build market may not be sufficient –** Stakeholders said that countries with a smaller fleet may not have enough new build vessels being purchased to fund waste management of older vessels;
- **Potential to take advantage of the system –** Consideration needs to be given to people who purchase vessels outside of the EPR system, take their vessels across borders and try to dispose of them in a nation with EPR in place;
- **Impact on price –** One stakeholder raised that they think adding the full cost onto new vessels could have an impact on businesses and suggested that this could be mitigated by breaking down the cost into annual fees (see section 3.6.6); and
- **Transport costs –** The cost of transporting vessels is often more expensive than dismantling and recycling, which should be considered in the design of any policy.

3.6.2 Mandatory registration

Mandatory registration received the most votes out of the policy options. Although it is in place in some nations, there is no data in the public domain as to how this has impacted recreational vessel abandonment. One workshop participant said that in their experience, countries with mandatory registration in place face challenges in registering older vessels and how this will be handled should be considered.

Of the nations represented in the workshops, none of them had mandatory registration for all vessels. Stakeholders shared the view that this would help to remove barriers in identifying owners of abandoned vessels and help to ensure costs of removal are passed to them. There may be some challenges associated with vessels abandoned in waters belonging to a country they are not registered in. It was suggested that OSPAR could gather best practices on developing and implementing registration to help support contracting parties and incentivise this action.

Representatives from Sweden said that their stakeholders were worried about how much a registration system would cost them. In the workshop in work package one, stakeholders were concerned that there would be challenges in ensuring that registration was passed between owners when a vessel was sold. Participants in the workshop did not seem to think that this would be as big of a risk, as a registration system works well for cars.

Some arguments against the mandatory registration of vessels were identified in the desk-based researched. The European Boating Association's (EBA) policy position on this matter is that it would require substantial bureaucratic and financial effort and that there is too much uncertainty that it would sufficiently solve the problem.[78] Additionally, they recognise that challenges in tracing owners is still likely to occur as boats can be abandoned in countries where they aren't registered, and new owners may fail to register their vessels.

[78] EBA (2022) *EBA Position Statement: Boat Registration*

3.6.3 Public funding for vessel management

Participants from Sweden shared that the funding programs that have been available in their country have been successful in managing end-of-life vessels. Other participants also saw the value in funding being available to help assist in removing vessels that had been abandoned and incentivise the management of end-of-life vessels. When asked how these schemes should be funded, participants agreed with each other that it should not purely be funded by the public purse and that owners of vessels should also be expected to contribute, perhaps in the form of an annual fee. Participants thought that OSPAR could play a role in facilitating cross-border funding and infrastructure, particularly in nations where there is not a large enough fleet to warrant a network of dismantling centres. It was also thought that the EU could play a role in funding and facilitating the recycling of composite materials which would support a number of industries, not just the recreational boating sector.

The only risk that was identified by stakeholders in the workshop was that there is always the risk of individuals cheating or taking the advantage of any system and that this needs to be minimised when designing any funding package. Despite not identifying many risks, this option was not favoured by participants. Only participants representing Sweden, which have had such funding in place, voted for this option. It did not receive votes from any other stakeholders. Whilst this was not explored in depth in the workshop, this could have been due to budget concerns. One stakeholder did say that such funding could be useful as start-up financing for any scheme, but that it would need to have long-term sustainable financing.

3.6.4 Best practice guidance

Whilst a lack of knowledge was identified as a barrier to responsible waste management of end-of-life vessels, this option was not favoured by participants in the workshop. This wasn't because stakeholders didn't see the value, but perhaps because they didn't see this as having the biggest impact on abandoned vessels and would not remove the biggest barrier to vessel owners which is cost. One stakeholder said that if any guidance is developed, it should target stakeholders across the industry and not just vessel owners. OSPAR could play a role in developing and coordinating a best practice guidance document that is then tailored to each of the contracting parties.

3.6.5 Circular design

Participants in the workshop thought that there was value in incentivising circular design in the manufacturing of new vessels. They thought that this could be achieved through the development of standards and definitions. It also needs to be coordinated with producers and the recycling industry to ensure that materials which can't be reused can be recycled effectively. This could help to prevent greenwashing, which was a concern raised in the workshop. Whilst circular design wouldn't address the issue of abandoned vessels now, it could future proof the sustainability of the sector.

Stakeholders in the workshop highlighted that there is currently a lack of economically viable technologies and that more progress would need to be made to ensure that all vessels were designed with circular concepts in mind.

3.6.6 Other options

In the workshops, participants were asked if they thought there were any other policy options that could be suitable for managing end-of-life recreational vessels to prevent abandonment. The following options were brought up, but due to time limitations were not explored in detail:

- **Spread the cost of waste management –** It was suggested that this could be achieved through an annual tax or insurance to help spread the cost across all of the owners. This was proposed as an alternative to putting all of the costs on either the first owner (as it would be through EPR) or the final owner;
- **Reduce the cost of transport –** It was emphasised that this really needs to be included in any policy option to effectively prevent abandonment as this cost can often be higher than recycling.
- **Develop a waste management strategy –** This could help encourage and coordinate the development of new technologies for recycling end-of-life vessels. There are still many challenges preventing effective recycling of materials, particularly GRP.
- **Policies should include all waterways –** The barriers to appropriate waste management of recreational vessels are not exclusive to those in marine waters. Some countries may have more inland vessels than marine, however, due to a lack of data these numbers are not clear.
- **Develop a methodology to monitor end-of-life vessels –** A standard methodology to estimate and monitor the number of recreational vessels and those at the end of their life would help to better define the problem and inform the development of policies that are proportionate and effective.
- **Licensing to enable vessels to be dismantled on site –** Stakeholders spoke of challenges in obtaining the appropriate licenses to enable vessels to be dismantled on the site where they are abandoned (for example, in ports). Enabling this would facilitate easier transport and waste management.

4 Conclusion

Due to the limited data on the number and types of vessels across the OSPAR Maritime Area, it makes it difficult to grasp the scale of the number of abandoned vessels or the number of vessels that are reaching the end of their life. Through desk-based research and stakeholder engagement, it is clear that abandoned vessels are occurring and that there is a cost to landowners, communities, public sector and the environment. GRP vessels appear to largely contribute to this problem as the material is abundant and difficult to recycle. It's difficult to know how many vessels

are coming to the end of their life each year, but with so many vessels being manufactured in the 70s and 80s, it's likely that this problem will continue, if not get worse.

Whilst the extent of the challenges identified may differ in each of the OSPAR nations, cost of waste management and difficulty in locating vessel owners appeared to be a challenge across the board. Lack of knowledge and infrastructure appeared to differ a little more, with some nations already taking steps to address these.

Mandatory registration of vessels was the preferred option in work package one and two as this would allow vessel owners to be identified and help to deter abandonment. However, it needs to be acknowledged that this already exists in some countries and it is unclear the impact this has on abandoned vessels. A consistent and coordinated approach may help to mitigate some of the risks that were associated with vessels being abandoned in regions where a mandatory register doesn't exist.

EPR is one option to address the barriers associated with cost and infrastructure. EPR could be designed to include several measures that stakeholders felt were important, including incentivising circular design, covering the cost of transport and funding waste management of vessels. Currently France is the only country with EPR for recreational vessels and they also mandate that all vessels must be registered, which shows that these policies could complement each other to address all or most of the barriers.

Interestingly in work package one, establishing national guidance on waste management was popular, but this was not a favoured approach among stakeholders engaged in work package two even though lack of knowledge was identified as a barrier. Desk-based research did not identify any detailed national guidance in any of the countries that did not participate in the workshop. This could reflect that it was not a priority for stakeholders engaged in this project or that the proper engagement and communication of the other preferred policies could help to address this barrier.

There were many challenges raised in work package one that were not raised by participants in this workshop but this may be due to time constraints. Additionally, it should be noted that the views shared in the workshop were limited to those who attended and not all OSPAR contracting parties were engaged. Views on these potential policy measures in the public domain were also limited.

In order to develop policies, a baseline on the number of vessels, those coming to the end of their life annually and the number of abandoned vessels needs to be established before deciding how to progress. A methodology for OSPAR nations to do so is set out in this report. This will help inform the design of any policy to ensure it is proportionate and financially sustainable. There is a role that OSPAR could play in coordinating this and providing examples of best practice. There is also a further role that OSPAR could play in coordinating the development and implementation of policies to facilitate the sharing of resources.

Appendix A Impact categories used in work package one to analyse policy options

In work package one, the potential policies were assessed against the following criteria:

- **Impact on abandoned vessels –** assessing whether the policy removes the barriers that lead to abandoned vessels;
- **Legal feasibility –** whether additional primary or secondary legislation are required to implement the policy;
- **Technical/logistical feasibility –** whether the technology exists and it is logistically feasible;
- **Economic impacts –** who incurs the costs associated with the policies;
- **Wider impacts (e.g., equality, businesses, social. etc.) –** including non-economic costs;
- **Geographical impacts –** whether any regions would be disproportionately impacted; and
- **Environmental impacts –** whether the policy would have a positive impact on the environment.

Appendix B Typical vessel profiles

The profiles outlined below were developed during previous unpublished research for Marine Scotland. During this research, stakeholders were asked to provide their thoughts on the percentage composition of each vessel type. During the current project, stakeholders were asked to verify the profiles. One trade association, one boat salvage/breakers and one ship yard/boat builder suggested changes to the profiles during the current project. These suggestions were used to update the typical vessel profiles, seen below.

Small sailing boat	*A dinghy, day boat or other small keelboat, usually taken out of the water at end of use. Average weight: 250kg. Average length: 5m.*
Material	Proportion of total vessel weight (%)
Fibreglass	50%
Cast iron	0%
Wood/plywood	10%
Aluminium and stainless steel	12%
Other	28%

Sailing Yacht	*Usually with cooking facilities and a place suitable for sleeping. Average weight: 8 tonnes. Average length: 11m.*
Material	Proportion of total vessel weight (%)
Fibreglass	40%
Cast iron	30%
Wood/plywood	15%
Aluminium and stainless steel	7.5%
Other	7.5%

Power boat	*A craft that can plane over water but excluding RIBS/Sportsboats. Average weight: 3.75 tonnes. Average length: 9m.*
Material	Percentage of total vessel weight
Fibreglass	40%
Cast iron	15%
Wood/plywood	20%
Aluminium and stainless steel	15%
Other	10%

Day Motor Boat	*River or coastal boat without cooking facilities or a place suitable for sleeping. Average weight: 3.75 tonnes. Average length: 9m.*
Material	Percentage of total vessel weight
Fibreglass	40%
Cast iron	15%
Wood/plywood	20%
Aluminium and stainless steel	15%
Other	10%

Motor Yacht	*River or coastal boat with cooking facilities and a place suitable for sleeping. Average weight: 5 tonnes. Average length: 12m.*
Material	Percentage of total vessel weight
Fibreglass	40%
Cast iron	15%
Wood/plywood	20%
Aluminium and stainless steel	15%
Other	10%

Row Boat A (Fibreglass = 90% of total)	*Average weight: 45kg. Average length: 4.25m.*
Material	Percentage of total vessel weight
Fibreglass	63%
Cast iron	0%
Wood/plywood	35%
Aluminium and stainless steel	2%
Other	0%

Row Boat B (Wooden = 10% of total)	*Average weight: 45kg. Average length: 4.25m.*
Material	Percentage of total vessel weight
Fibreglass	0%
Cast iron	0%
Wood/plywood	98%
Aluminium and stainless steel	2%
Other	0%

RIB/Inflatable/Sports boat	*Excluding power boats - usually with an engine. Average weight: 250kg. Average length: 7.5m.*
Material	Percentage of total vessel weight
Fibreglass	55%
Cast iron	25%
Wood/plywood	0%
Aluminium and stainless steel	5%
Other	15%