



Analysis of Small Leisure Boating Safety in Spain: A Case of Basque Country

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ABSTRACT

Recreational boating has grown steadily in Spain, driven by small craft, personal watercraft and increasingly accessible navigation equipment. This study analyses whether the training associated with the Navigation Licence (*Licencia de Navegación*) is consistent with candidates' actual knowledge and with the operational risks observed in the Basque Country. A descriptive mixed-methods design was adopted: a survey of 466 candidates (2023-2025) and an analysis of recreational-craft incidents coordinated by the Bilbao Maritime Rescue Coordination Centre (MRCC) between 2017 and 2024. The results show uneven knowledge of the licence's privileges: time-of-day restrictions are widely known (92.9%), but only 19.2% correctly identify the legal navigation limits, with further gaps regarding engine power (36.4%) and the territorial validity of the licence (22.5%). In addition, 51.4% of the 1,943 Search and Rescue (SAR) services analysed involved recreational craft, with a predominance of vessels adrift or not under command (81.9%). These results suggest the need to update the minimum training content, strengthening passage planning, meteorology, legal limits, basic maintenance and decision-making.

1. Introduction.

1.1. Context and scope of the study.

Nautical-sport and recreational boating activities have grown steadily since the late twentieth century (Rodrigo de Larrucea, 2009). This growth has been favoured by the expansion of the training offer, the accessibility of small craft, the popularisation of personal watercraft and the development of electronic equipment and mobile applications for navigation and meteorology.

The conceptual delimitation of recreational boating is not straightforward. Part of the literature places it within nautical

tourism or maritime tourism (Gómez Javaloyes, 2012), whereas other approaches relate it to active tourism (Boletín Oficial de Canarias, 2017), sports leisure (Bonetti et al., 2014) or recreational activity carried out in the marine environment. The main focus is not the tourism dimension, but the relationship between basic nautical training, users' actual competence and operational safety.

Therefore, recreational boating is understood as the activity carried out by navigators and users of recreational craft, whether owners or not, who use the craft mainly for recreational or sporting purposes (Lam González, 2017), and not for the professional transport of passengers or goods. The analysis focuses specifically on situations in which the user directly participates in the command of the craft by means of an official nautical qualification (Boletín Oficial del Estado, 2014).

The concept of a sports craft appears in the legislation currently in force from Royal Decree 1027/1989 on flagging, registration of vessels and maritime registry (Boletín Oficial del

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Estado, 1989). At that time, a reorganisation of the Spanish fleet was considered necessary, since the previous regulation dated from 1968 (Boletín Oficial del Estado, 1968) and, over the intervening two decades, relevant changes had taken place affecting the fleet as a whole, including Spain's entry into the European Economic Community. Article 4 of Royal Decree 1027/1989 establishes that the Register of Vessel Enrolment is organised into "lists" according to the activity of each vessel. In relation to this study, List 6 covers sports or recreational craft operated for profit, while List 7 covers those operated without profit.

1.2. Research problem.

The literature on nautical tourism and recreational boating has devoted considerable attention to economic, tourism, management, marketing and nautical-tourist behaviour variables - (Spinelli and Benevolo, 2022). However, the analysis of the fit between minimum training programmes, effectively acquired competences and patterns of maritime incidents has received comparatively less attention (Torralbo Gavilán, 2016).

The Navigation Licence (*Licencia de Navegación*) regulated by Royal Decree 875/2014 (Boletín Oficial del Estado, 2014) constitutes the basic level of access to the command of certain recreational craft and personal watercraft. Its relevance for safety is evident: it authorises daytime navigation on craft up to 6 metres in length and on personal watercraft, provided that they do not move more than 2 nautical miles (nm) in any direction from a port, marina or place of shelter. However, it is obtained after very brief training and without a final assessment test.

This context raises a central question: whether the current minimum training model ensures that users sufficiently understand the legal limits, operational conditions and safety-critical decisions before assuming command of a recreational craft.

1.3. Aim and research questions.

The general aim of this study is to analyse whether the training model associated with the Navigation Licence is aligned with the knowledge, perceptions and operational risks observed among entry-level users of recreational boating in the Basque Country. Based on this aim, the following research questions are proposed:

1. To what extent do candidates know the legal privileges and limitations of the Navigation Licence?
2. What safety-critical sources of information, especially meteorological information, do candidates use or expect to use?
3. Are the gaps identified consistent with recurrent Search and Rescue (SAR) incident patterns involving recreational craft in the Bilbao Maritime Rescue Coordination Centre (MRCC) area?

2. Methodology.

2.1. Study design.

A mixed-methods design was adopted based on: (i) a survey administered to 466 candidates for the Navigation Licence in the Basque Country during the period 2023-2025, conducted after completion of the theoretical training and before the start of practical navigation sessions; and (ii) the analysis of incident records coordinated by the Bilbao MRCC during the period 2017-2024. In the SAR records, cases involving recreational craft were filtered and their temporal and typological patterns were described.

First, descriptive statistics were used to quantify the proportion of recreational-craft incidents relative to the total number of annual assistance services and to characterise the distribution of the different types of incident. Second, a questionnaire was used to assess candidates' perceptions, their prior knowledge of the privileges and limitations of the licence, their perceived quality of the training received and their information-seeking behaviour for safety-related decision-making, with particular attention to the meteorological information sources used. The survey results were analysed, stratified by demographic group.

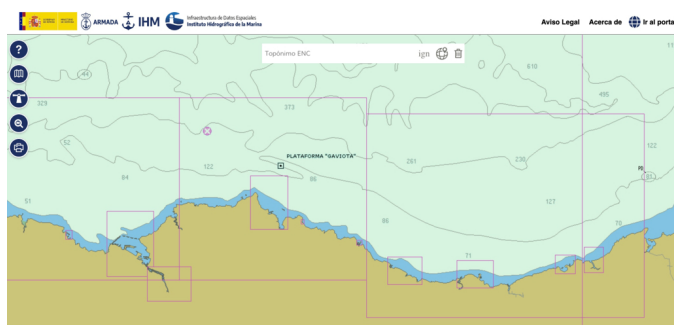
2.2. Study area.

The study focuses on the Basque Country, with particular attention to the Bizkaia area and the area of responsibility of the Bilbao MRCC. This area combines a high concentration of recreational boating users, marinas and coastal navigation areas with meteorological and sea conditions that can change rapidly.

The Basque coast extends for approximately 246 km along the Cantabrian Sea (Gobierno Vasco, 2026) and is characterised by a rugged coastline, with a predominance of cliffs and limited availability of sheltered areas outside ports and estuaries (Instituto Hidrográfico de la Marina, 2023). Recreational boating is mainly concentrated in ports and marinas such as Getxo Marina, the Real Club Marítimo del Abra, Hondarribia Marina, Bermeo Marina, Donostia-San Sebastián Marina, Mutriku Marina and Zumaia Marina, as well as numerous yacht clubs and fishing ports with recreational activity. Usual navigation areas include the Abra of Bilbao and the Getxo-Sopela coast, the Urdabai Biosphere Reserve, the area around San Juan de Gaztelugatxe, the coast between Bermeo and Lekeitio, La Concha Bay and the eastern coastline towards Hondarribia.

From an operational perspective, navigation takes place - mainly along an open coast exposed to the Cantabrian Sea, with limited natural protection outside ports and estuaries. Meteorological and oceanographic conditions are influenced by the frequent passage of Atlantic low-pressure systems in autumn and winter, generating episodes of strong wind, swell and significant wave height. During the summer season, conditions are generally more favourable for recreational boating; however, rapid weather changes associated with thermal breezes, coastal fog and episodes of *galerna* are relatively frequent. The *galerna* is a characteristic phenomenon of the Cantabrian coast that can cause a significant deterioration of navigation conditions in a short time through sudden increases in wind and wave height (García Arteche, 2008).

Figure 1: Study area.



Source: Instituto Hidrográfico de la Marina, 2026.

These features make the assessment of recreational boaters' preparedness and the adequacy of the basic training required to obtain the Navigation Licence especially important on the Basque coast (Gómez Martín, 2005).

2.3. Data source 1: survey of Navigation Licence candidates.

A structured and anonymous questionnaire was designed for candidates who completed the Navigation Licence course in the Basque Country between 2023 and 2025. The survey was administered in person in the classroom after completion of the theoretical training and before the start of practical navigation sessions.

Participation was voluntary and anonymous. No information allowing personal identification of participants was collected, thereby ensuring the confidentiality of responses and their use exclusively for research purposes.

A non - probability convenience sampling procedure was used, including students enrolled in courses delivered by Polaris Nautika Eskola during the study period. Polaris Nautika Eskola is owned by one of the authors (H.G.), a circumstance expressly declared (see Conflict of interest statement). The questionnaire was administered anonymously and voluntarily, and participation or responses had no effect on students' training, assessment or obtaining of the licence. A total of 466 valid questionnaires were obtained for analysis.

The questionnaire comprised 13 questions concerning participants' demographic characteristics, motivations for obtaining the licence, expectations of future use, meteorological information sources used before navigating, self-perceived nautical knowledge and knowledge of the legal privileges and limitations associated with the Navigation Licence.

Most questions were closed - ended and multiple-choice. Some allowed multiple responses, especially those related to motivations for obtaining the licence and meteorological information sources used.

The knowledge items were formulated as closed statements whose correctness had to be identified by participants. These statements were designed to detect common confusions between the legal wording of the privileges and the simplifications frequently used in commercial or informational language about the licence.

Blank responses were retained in the database. In descriptive variables, they were treated as missing values and excluded only from the analysis corresponding to each variable. However, in questions intended to assess knowledge of the legal privileges and limitations of the Navigation Licence, blank or unanswered responses were coded as incorrect, as they were interpreted as an absence of verifiable knowledge of the content assessed. The non-response rate was low, remaining below 1.1% in all variables analysed.

2.4. Data source 2: SAR incident records.

Incident data were obtained from the historical database of Salvamento Marítimo (SASEMAR) interventions (Ministerio de Transportes y Movilidad Sostenible, 2026), corresponding to the period 2017-2024. The database records assistance and emergency services handled by the different Spanish Maritime Rescue Coordination Centres.

For each incident, information is available on the service date, responsible coordination centre, geographical position (latitude and longitude), type of emergency, emergency subtype, number of vessels involved by category (merchant, fishing, recreational and other vessels) and number of persons rescued by SASEMAR.

In order to analyse incidents related to recreational boating within the study area, a multi-stage filtering process was applied. First, only records coordinated by the Bilbao MRCC were selected. Second, only incidents in which at least one recreational craft was involved (Number of Recreational Vessels > 0) were retained. Subsequently, records whose location lay outside the geographical scope defined for the study were excluded. Records with insufficient geographical information were also excluded.

The original database does not provide a unique incident identifier that would allow possible duplicates between records to be verified. Nevertheless, each observation was considered an independent service recorded by SASEMAR, following the criterion used in the organisation's official statistics.

To spatially approximate the operational area closest to the Navigation Licence, the distance between the recorded position of each incident and the nearest reference port was calculated using the Haversine formula, with the result expressed in nautical miles to make it comparable with the spatial limit established in the privileges of the Navigation Licence. On the basis of this calculation, incidents were classified into two groups: those located less than 2 nautical miles from the nearest reference port and those located 2 nautical miles or more away. The reference ports considered were Bilbao/Getxo, Pasaia, Bermeo, Lekeitio, Ondarroa, Zumaia, Zarautz and Castro Urdiales, the latter included because of its proximity to the operational area analysed.

This classification should not be interpreted as verification of compliance or non-compliance with the legal limits of the Navigation Licence, since the database does not allow reconstruction of the craft's previous track, identification of the port, marina or place of shelter actually used as a reference, or necessarily determination of the skipper's qualification. Therefore,

the analysis of incidents located less than 2 nautical miles away should be understood as a spatial approximation to the operational environment closest to basic recreational boating, and not as a direct attribution to holders of the Navigation Licence.

2.5. Variables and statistical analysis.

The analysis is based mainly on descriptive statistics: absolute frequencies, percentages, distribution by demographic groups, distribution by territorial origin and comparison of correct and incorrect responses in knowledge questions. In addition, Pearson's χ^2 tests of independence were applied to analyse possible associations between categorical variables, in particular participants' age, sex, territorial origin and previous experience. In none of the cross-tabulations analysed was it necessary to use Fisher's exact test: where low-frequency categories appeared, adjacent categories were grouped (as detailed in the corresponding table notes) so that the conditions for applying the χ^2 test were met in all cases (expected frequencies equal to or greater than 5 in all cells). The data were cleaned and coded in Microsoft Excel 365, which was used for the descriptive analyses. Categorical variables were summarised using absolute and relative frequencies, while continuous variables were described using measures of central tendency and dispersion where appropriate. The χ^2 independence tests and effect sizes (Cramer's V) were calculated from the contingency tables presented.

In order to analyse the possible influence of the geographical environment of residence on perceptions, knowledge and habits related to recreational boating, a territorial variable was constructed from the postal codes declared by participants. Municipalities were grouped into four categories: coastal municipalities, Bilbao metropolitan area, inland Basque Country and other autonomous communities.

This classification is based on the hypothesis that habitual proximity to the marine environment may influence previous nautical experience, the degree of familiarity with navigation conditions and exposure to recreational activities linked to the sea. Coastal municipalities represent populations with direct access to the coastline, while the Bilbao metropolitan area constitutes the main urban centre of the region and concentrates a significant share of recreational boating users, despite not necessarily being linked to everyday maritime activities. Inland Basque municipalities, in turn, allow analysis of the behaviour of participants with potentially less contact with the maritime environment. Finally, the category "other autonomous communities" includes participants residing outside the Autonomous Community of the Basque Country.

The creation of this variable made it possible to assess whether geographical proximity to the coast was associated with differences in knowledge of the legal limitations of the Navigation Licence, meteorological information sources used and previous navigation experience.

2.6. Methodological limitations.

- The survey does not constitute a probabilistic sample of all recreational boating users, but rather a sample of Navigation Licence candidates in the Basque Country.

- The SAR records do not allow each incident to be directly attributed to holders of the Navigation Licence, nor do they necessarily the skipper's qualification to be determined.
- The identification of incidents in areas compatible with the licence limits should be interpreted as contextual evidence, not as causal proof.
- Responses concerning meteorological information habits and expectations of use may be subject to social desirability bias or to differences between stated intention and actual behaviour.
- The sample comes from a single nautical school linked to one of the authors (H.G.), which may introduce biases in geographical origin and student profile. The results should be interpreted in this context, and their generalisation to other territories would require replication with independent centres.

3. Results.

3.1. Regulatory and social context of the Navigation Licence.

Since the entry into force of Royal Decree 875/2014, the Navigation Licence has become established as a basic access route to recreational boating. In the Basque Country, the annual number of licences issued has generally remained around 1,500, according to data provided by the Directorate of Ports, Maritime Affairs and Coastline of the Basque Government, with a notable increase in 2020 and 2021. This increase may be cautiously related to the post-COVID-19 pandemic context and to greater social demand for outdoor activities in less crowded environments.

In parallel, the inclusion of nautical qualifications as a requirement or merit in certain public employment selection processes, such as the Vitoria-Gasteiz City Council call for 23 specialist firefighter positions, published in BOTHA No. 72 of 28 June 2024, may have contributed to a temporary increase in demand for licences. However, this relationship should be interpreted with caution, as no specific data are available to attribute such an increase exclusively to this factor.

3.2. Participant profile.

The sample comprised 466 candidates for the Navigation Licence and was predominantly male, while the largest age group was 25-44 years (51.3%).

Table 1: Navigation Licences issued by the Basque Government, 2016-2025.

Year	Navigation Licences issued
2016	1,468
2017	1,440
2018	1,485
2019	1,624
2020	2,357
2021	2,506
2022	1,590
2023	1,493
2024	1,664
2025	1,522

Source: Directorate of Ports, Maritime Affairs and Coastline of the Basque Government.

Table 2: Distribution of the sample by sex.

Sex	n	%
Male	359	77.0%
Female	105	22.5%
Prefer not to answer	1	0.2%
No response	1	0.2%

Source: Authors.

Table 3: Distribution of the sample by age group.

Age group	n
16-17 years	17
18-24 years	98
25-34 years	137
35-44 years	102
45-54 years	62
55-64 years	44
≥65 years	3
No response	3

Source: Authors.

3.3. Knowledge of legal privileges and navigation limits.

The privileges associated with the Navigation Licence include the command of motor or sailing recreational craft up to 6 metres in length and personal watercraft, in daytime navigation, without moving more than 2 nautical miles in any direction from a port, marina or place of shelter. Candidates were presented with a knowledge questionnaire on these privileges and restrictions.

Table 4: Percentages refer to the proportion of candidates who correctly identified each statement as true or false.

Question	valid n	Correct answers	% correct
No final examination is required	465	280	60.2%
Navigation is allowed at any time	465	432	92.9%
Navigation in sailing craft is permitted	464	240	51.7%
Navigation is allowed up to 2 nm from the coast	463	89	19.2%
There is no express engine-power limitation	464	169	36.4%
Territorial validity of the licence	463	104	22.5%

Source: Authors.

Table 5: Distribution of the overall result in the knowledge test.

Correct answers	n	%
100%	14	3.1%
>50%	148	32.5%
50%	116	25.5%
<50%	177	38.9%

Note: valid n = 455

Source: Authors.

The results show uneven knowledge of the licence's privileges. The restriction concerning daytime navigation is widely identified, whereas legal navigation limits, the absence of an express engine-power limitation and the validity of the licence show clearly lower levels of correct responses.

The most important finding from a safety perspective is the lack of knowledge of the legal navigation limits: only 19.2% of candidates answered the item correctly concerning maximum distance, indicating frequent confusion between navigating 2 nautical miles from the coast and navigating 2 nautical miles from a port, marina or place of shelter.

Table 6: Knowledge of legal navigation limits by territorial area of residence.

Territorial area	Correct n (%)	Incorrect n (%)	Total
Coastal municipalities	12 (14.3%)	72 (85.7%)	84
Bilbao metropolitan area	38 (23.8%)	122 (76.3%)	160
Inland Basque Country	27 (17.5%)	127 (82.5%)	154
Other autonomous communities	12 (17.6%)	56 (82.4%)	68
Total	89 (19.1%)	377 (80.9%)	466

Source: Authors.

The possible association between participants' area of residence and knowledge of the legal navigation limits of the Navigation Licence was analysed using Pearson's χ^2 test of independence. Although descriptive differences between territorial groups were observed, with percentages of correct responses ranging from 14.3% to 23.8%, these differences were not statistically significant ($\chi^2 = 3.84$; $df = 3$; $p = 0.280$).

The effect size was small (Cramer's $V \approx 0.091$), indicating a weak association between the two variables. It might be expected that candidates residing in coastal municipalities, being more familiar with the marine environment, would show greater knowledge of the licence's legal limitations; however, the data do not support this expectation: descriptively, coastal municipalities show the lowest percentage of correct responses (14.3%) and the Bilbao metropolitan area the highest (23.8%), although these differences do not reach statistical significance. Habitual proximity to the coast therefore does not translate into better knowledge of legal limitations at the entry level analysed.

Table 7: Knowledge of legal navigation limits by age group.

Age group	Correct n (%)	Incorrect n (%)	Total
16-24 years	17 (14.8%)	98 (85.2%)	115
25-34 years	30 (21.9%)	107 (78.1%)	137
35-44 years	24 (23.5%)	78 (76.5%)	102
45-54 years	11 (17.7%)	51 (82.3%)	62
≥55 years	5 (10.6%)	42 (89.4%)	47
Total	87 (18.8%)	376 (81.2%)	463

Note: The total differs from the overall sample size owing to missing age data or the absence of a valid response. For the χ^2 analysis, the extreme age categories were grouped (16-17 with 18-24, and 55-64 with ≥65) to ensure expected frequencies ≥ 5; the lower limit of 16 years corresponds to the minimum legal age for obtaining the Navigation Licence.

Source: Authors.

The possible relationship between participants' age and knowledge of the legal navigation limits associated with the Navigation Licence was analysed using Pearson's χ^2 test of independence. Although descriptive differences between age groups were observed, with percentages of correct responses ranging from 10.6% to 23.5%, these differences did not reach statistical significance ($\chi^2 = 5.67$; $df = 4$; $p = 0.225$).

The effect size was small (Cramer's $V = 0.111$), indicating a weak association between the two variables. These results suggest that knowledge of the legal limits of the Navigation Licence does not depend significantly on participants' age.

This result suggests that the gaps detected in understanding the privileges and limitations of the Navigation Licence affect participants relatively uniformly, regardless of age. Consequently, the deficits observed appear to be more related to aspects of the training process or the communication of content than to specific demographic characteristics of candidates. No significant associations were observed with sex or previous experience either.

3.4. Meteorological information and decision-making.

Decision-making in recreational boating depends to a large extent on the ability to interpret meteorological information and

assess its reliability. Among entry-level users, the choice of meteorological sources can be an indirect indicator of safety culture, nautical literacy and risk perception.

Table 8: Meteorological sources declared by candidates.

Meteorological source	n	%	Notes
I check the weather on my mobile phone	225	48.3%	General weather applications integrated into mobile phones
Official meteorological services (Euskalmet or AEMET)	126	27.0%	Official meteorological organisations
Specialised applications and websites (Windguru, Windfinder, Windy, etc.)	90	19.3%	Specific tools for nautical and sporting activities
I do not usually obtain any meteorological information	12	2.6%	No consultation of meteorological information before navigating
Commercial TV/radio	9	1.9%	Traditional media
No response	4	0.9%	Missing values

Source: Authors.

The meteorological information source most frequently used by participants was checking the weather through general mobile - phone applications (48.3%), followed by official meteorological services, such as Euskalmet or AEMET (27.0%), and specialised meteorological applications or websites for marine weather (19.3%). A total of 2.6% of respondents stated that they did not usually consult any meteorological information before navigating, while only 1.9% reported using commercial television or radio.

The predominant use of general applications should not automatically be interpreted as an unsafe practice, but it does suggest a possible dependence on simplified sources that may not provide sufficient information on wind, gusts, sea state, coastal warnings or rapid changes characteristic of the Cantabrian coast.

3.5. SAR incident patterns in the Bilbao MRCC area.

SAR records make it possible to contextualise the survey results within the actual operational environment of recreational boating, without attributing incidents to holders of the Navigation Licence (see Methodology).

In the period 2017-2024, 1,943 services were coordinated by the Bilbao MRCC, of which 998 involved at least one recreational craft. This means that 51.4% of the services analysed in the Bilbao MRCC area involved recreational craft. These figures show that recreational boating accounts for a very substantial part of the operational workload of the coordination centre.

Applying the distance-to-nearest-reference-port criterion described in the methodology section, of the 998 services involving recreational craft recorded between 2017 and 2024, 401 were located less than 2 nautical miles away, representing 40.2% of cases. The remaining 597 services, equivalent to 59.8%, were located 2 nautical miles or more away.

The concentration of incidents less than 2 nautical miles away is of particular interest for this study, as it approximates the spatial environment in which many small recreational craft operate and the usual area of use of the Navigation Licence, subject to the interpretative cautions noted in the methodology.

Table 9: SAR incidents in the Bilbao MRCC area involving recreational craft, 2017-2024.

Year	Total SAR Bilbao MRCC	Rec. craft	% rec. craft	Rec. craft <2 nm	% <2 nm of rec. craft	Rec. craft ≥2 nm
2017	213	137	64.3%	46	33.6%	91
2018	173	103	59.5%	38	36.9%	65
2019	247	123	49.8%	54	43.9%	69
2020	223	96	43.0%	37	38.5%	59
2021	250	122	48.8%	42	34.4%	80
2022	293	141	48.1%	70	49.6%	71
2023	273	120	44.0%	53	44.2%	67
2024	271	156	57.6%	61	39.1%	95
Total	1,943	998	51.4%	401	40.2%	597

Source: Own elaboration based on SASEMAR records.

From a typological point of view, incidents involving recreational craft in the Bilbao MRCC area show a very marked concentration. The subtype “vessel adrift / not under command” accounts for 817 of the 998 services analysed, i.e. 81.9% of the total. This predominance is even more pronounced among incidents located less than 2 nautical miles away: 351 of the 401 cases close to the reference port belong to this subtype, equivalent to 87.5% of all recreational-craft incidents located less than 2 nautical miles away.

Table 10: Distribution of recreational-craft incidents by subtype and proximity to the nearest reference port, Bilbao MRCC, 2017-2024.

Incident subtype	Total rec. craft	% of rec. craft	<2 nm	% <2 nm within subtype	≥2 nm
Vessel adrift / not under command	817	81.9%	351	43.0%	466
Grounding / stranding	62	6.2%	20	32.3%	42
Water ingress	28	2.8%	10	35.7%	18
Sinking	22	2.2%	4	18.2%	18
Capsizing	17	1.7%	7	41.2%	10
Other services	12	1.2%	1	8.3%	11
Medical evacuation vessel-shore	9	0.9%	2	22.2%	7
Fire / explosion	6	0.6%	0	0.0%	6
Missing vessel / no news	4	0.4%	1	25.0%	3
Automatic distress signals	4	0.4%	1	25.0%	3
Man overboard	4	0.4%	1	25.0%	3
Other distress signals	3	0.3%	1	33.3%	2
Anchored vessels	3	0.3%	0	0.0%	3
Dragging anchor	2	0.2%	0	0.0%	2
From sunken vessel	2	0.2%	1	50.0%	1
Flare sighting	2	0.2%	1	50.0%	1
Collision	1	0.1%	0	0.0%	1
Total	998	100.0%	401	40.2%	597

Source: Own elaboration based on SASEMAR records.

The predominance of the subtype “vessel adrift / not under command” is relevant from the perspective of basic nautical training. It should be borne in mind that this subtype constitutes a broad operational category in SAR records and does not necessarily correspond to a single technical cause.

Although the database does not disaggregate the specific causes of this category, this type of situation may be compatible with mechanical failures, propulsion-system failure, fuel-

related problems, maintenance deficiencies, planning errors or loss of steering capability. By itself, the figure alone does not establish a specific cause to be established, but it does point to the importance of preventive routines and self-assessment skills before and during the voyage.

The monthly distribution of incidents shows clear seasonality. In the period 2017-2024, the months of June, July and August accounted for 514 of the 998 services involving recreational craft, equivalent to 51.5% of the total. This concentration coincides with the season of greatest recreational activity. Among incidents located less than 2 nautical miles away, seasonality is also evident: June, July and August accounted for 206 of the 401 cases close to the reference port, i.e. 51.4%.

Table 11: Monthly distribution of recreational-craft incidents and proximity of less than 2 nautical miles, Bilbao MRCC, 2017-2024.

Month	Total recreational craft	<2 nm	% <2 nm
January	37	20	54.1%
February	40	9	22.5%
March	48	22	45.8%
April	52	24	46.2%
May	68	30	44.1%
June	121	52	43.0%
July	207	79	38.2%
August	186	75	40.3%
September	87	33	37.9%
October	59	29	49.2%
November	53	17	32.1%
December	40	11	27.5%
Total	998	401	40.2%

Source: Own elaboration based on SASEMAR records.

These results reinforce the relevance of analysing entry-level recreational-boating training not only from a regulatory perspective, but also from an operational perspective. The existence of 401 incidents located less than 2 nautical miles from the nearest reference port shows that proximity to a point of shelter does not eliminate risk or reduce the need for sound basic competences. Even apparently short and low-complexity navigations may lead to situations requiring assistance from SASEMAR.

4. Discussion: training adequacy and safety implications.

The results suggest a substantial mismatch between the privileges granted by the Navigation Licence, the minimum training required and the knowledge demonstrated by a significant proportion of candidates. This mismatch does not affect all content equally: time-of-day restrictions appear to be widely in-

ternalised, whereas spatial navigation limits, engine power and the legal validity of the licence show much weaker levels of knowledge. These results provide empirical evidence of the gap between minimum training and effective competence already noted by Torralbo Gavilán (2016) for the Spanish context.

From an operational-safety perspective, lack of knowledge of legal navigation limits is the finding with the greatest safety implications. Confusing “2 nautical miles from the coast” with “2 nautical miles from a port, marina or place of shelter” may alter passage planning, assessment of fuel and range, meteorological exposure, choice of safety equipment and response time in an emergency.

The joint reading of the survey and SAR records is particularly relevant when considering incidents located less than 2 nautical miles from the nearest reference port. Although this spatial criterion does not allow incidents to be attributed to holders of the Navigation Licence, it does bring a substantial share of the incident caseload close to the usual operational environment of basic recreational boating. The fact that 401 incidents, equivalent to 40.2% of the recreational-craft cases analysed, fall within this area reinforces the idea that proximity to a port or shelter does not remove the need for adequate training in planning, fuel and range, maintenance, meteorology and response to failures.

The combination of survey and SAR incidents does not enable a direct causal relationship to be established between training gaps and specific incidents. However, it does provide an empirical basis for arguing that entry - level training content should strengthen practical competences in decision-making, pre-departure planning, meteorological interpretation (Martínez de Osés, 2004), legal limits, fuel and range, basic maintenance and failure prevention.

These results are also relevant in the European debate on mutual recognition of recreational-boating qualifications (Kourounioti and Burgess, 2025; Torralbo Gavilán, 2016). Any harmonisation process should consider not only the formal equivalence of licences (Alonso-Enriquez et al., 2020), but also minimum competence standards and the effective verification of learning at basic access levels.

5. Conclusions.

- The study shows that candidates for the Navigation Licence have uneven knowledge of the legal privileges and limitations of the qualification.
- The main gaps are concentrated in aspects with direct safety implications: legal navigation limits, engine power, validity of the licence and, to a lesser extent, sailing navigation.
- SAR records involving recreational craft in the Bilbao MRCC area during the period 2017-2024 provide an operational context that reinforces the need to review basic training. In particular, the identification of 401 incidents located less than 2 nautical miles from the nearest reference port shows that a considerable part of assistance

services occurs in a spatial environment compatible with basic recreational boating, although the data do not allow these specific incidents to be attributed to holders of the Navigation Licence.

- The results support updating the minimum content of entry-level training by explicitly incorporating departure planning, meteorology, fuel and range, basic maintenance, legal limits and decision-making.
- In a European scenario of possible mutual recognition of recreational-boating licences, the definition of minimum competence standards is increasingly important to prevent formal harmonisation from reducing safety safeguards.

Conflict of interest statement

- One of the authors (H.G.) owns Polaris Nautika Eskola, the nautical training centre where the survey used in this study was administered. Student participation was voluntary and anonymous, had no effect on their training, assessment or obtaining of the licence, and the data were used exclusively for research purposes. The incident records come from official public sources (SASEMAR) external to the authors. The authors declare that these circumstances have not influenced the study design, data analysis or conclusions presented.

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