

Original research papers

SAFETY IN SAILING TOURISM: THE CASE OF THE GREAT MASURIAN LAKES ROUTE

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Abstract

Introduction. Recreational sailing has become an increasingly popular form of leisure in Poland. The well-known Great Masurian Lakes Route (GMLR) allows visitors to explore picturesque locations that are inaccessible from land. Most scientific studies focus on safety in maritime sailing, whereas there is a lack of publications and scholarly analysis concerning yacht sailing on lakes. The aim of this study was to explore the experiences of skippers with varying levels of qualifications regarding the factors affecting sailing safety, as well as to analyze police statistics and data from the Masurian Volunteer Rescue Service (MOPR) concerning incidents involving vessels on GMLR. **Material and Methods.** A survey of skippers' opinions was conducted during the summer seasons of 2024-2025 at seven ports located along GMLR. An original questionnaire developed by the authors was used, and its reliability was assessed ($Kappa = 0.92$). Data on police interventions were provided by the Head of the Social Communication Department of the Provincial Police Headquarters in Olsztyn. Data on rescue operations and other activities were obtained from MOPR based in Giżycko. **Results.** Nearly half of the surveyed yacht skippers (49.5%) consider the need for changes in legal regulations to be justified, while 57.2% see the need for mandatory sailing training before taking the exam. Checking the weather before departing from the port and properly responding to weather changes and received warning signals are the main factors affecting sailing safety. More than half of the respondents (55%) see the need for a universal and free warning-information application for sailors. A significant proportion of sailors consume alcohol during sailing trips or do so occasionally. **Conclusions.** Sailors report having very good or good knowledge of legal regulations; however, not all of them adhere to these rules during sailing trips, as confirmed by police statistics. The dangerous situations experienced by the respondents and their safety concerns do not lead to the perceived need to purchase liability insurance.

Keywords: sailing safety, recreation, qualified tourism, yachting, sailing accidents

Introduction

Yacht sailing as a form of leisure has been steadily developing, attracting an ever-growing number of participants [1]. The most well-known Great Masurian Lakes Route (GMLR) is highly valued for its natural richness and picturesque landscapes, offering both recreational and increasingly comfortable sailing opportunities thanks to numerous investments in waterways and marinas [2, 3]. According to the Polish Sailing Market Report 2016, 3.5 million people in Poland were actively engaged in sailing, of whom 1.3 million were able to independently operate a yacht. In the following years, these numbers were expected to rise further, also due to the influx of foreign tourists [4]. Meanwhile, data presented in 2019 by the Polish Yachting Association (PYA) estimated the number of sailors at 4.3 million [5].

The undeniable advantages of sailing should not overshadow the issue of safety in this form of tourism. Safety concerns relate both to factors beyond sailors' control, such as weather conditions, as well as to those associated with their qualifications, experience, and behavior while sailing [6, 7, 8, 9, 10].

A sudden change in meteorological conditions can create dangerous situations on the water and may even lead to tragedy, as in the case of the 2007 white squall on the Masurian Lakes, which capsized dozens of yachts and claimed 12 lives [11]. In many cases, the primary cause was skippers' insufficient ability to assess weather conditions. Their inadequate response to

danger was linked both to the conscious disregard of rapidly changing weather and to a lack of experience. According to the Masurian Volunteer Rescue Service (MOPR), eighty sailors rescued from the water in 2007 were not wearing life jackets [12].

Sailing tourism in Poland and the operation of yachts on inland waters are regulated by the Inland Navigation Act of December 21, 2000 [13]. The liberalization of legal provisions concerning sailors' qualifications, introduced by the Regulation of the Minister of Sport and Tourism of April 9, 2013 on water tourism [14], allows sailing on yachts with a hull length of up to 7.5 meters without the requirement of holding a qualification certificate issued by the Polish Yachting Association (PYA). This change increased the number of people engaged in sailing but did not translate into greater competence, and consequently, into improved safety. The amendment of the regulations also concerned sailing training. Individuals applying for a sailing license were released from the obligation to undergo mandatory training. It is only necessary to pass an exam before the appropriate commission. The documents confirming qualifications to operate sailing yachts with a hull length exceeding 7.5 meters are the following licenses: yacht sailor, sea yacht helmsman, and yacht captain, all issued by the PYA. The minimum age requirement for yacht sailors is 14 years [15, 16].

The entities directly involved in ensuring safety and supervising individuals engaged in sailing are MOPR and the Police. The former is an organization bringing together rescuers in the

Masuria region, carrying out water rescue tasks both independently and in cooperation with the Police, the Fire Service, and the Air Rescue Service.

Duties on the water are also performed by the Police commonly referred to as the “Water Police”. This widely used term is informal, as it has no basis in the official structure of the Police [17].

Most scientific studies focus on safety in maritime sailing [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29], whereas there is a lack of publications and scholarly analysis concerning yacht sailing. The numerous hazards associated with sailing tourism, the current legal framework in Poland, and the annual occurrence of accidents justify conducting research on this topic.

Therefore, the aim of this study was to explore the experiences of skippers with varying levels of qualifications regarding the factors influencing sailing safety, including the training system, applicable legal regulations, and skippers' behavior, as well as to analyze Police and MOPR statistics concerning incidents involving yachts navigating the Great Masurian Lakes Route (GMLR).

Material and Methods

A survey of skippers' opinions was conducted during the summer seasons of 2024–2025 at seven ports located along the GMLR, in both the northern and southern sections (Tab. 1). The study involved 325 randomly selected respondents who were yacht skippers moored at the port on the day of the survey and who consented to participate. This was a study approved by the Senate Research Ethics Committee of Jozef Pilsudski University of Physical Education in Warsaw (no. 01-31/2012). The study was conducted in accordance with the Declaration of Helsinki.

Table 1. Ports where the study was conducted and the number of skippers surveyed at each port (n = 313)

PORT	n	%
Ekomarina Giżycko	75	24.0
Wioska Żeglarska Mikołajki	69	22.0
AZS Wilkasy Giżycko	49	15.7
Bocianie Gniazdo Ryn	54	17.3
Nowy Sztynort	43	13.7
Klub Mila Kamień	23	7.3
TOTAL	313	100

Survey of skippers' opinions

An original questionnaire developed by the authors was used in the study. For the final analysis, 313 fully completed questionnaires were included, comprising 64 women and 249 men. The questionnaire was divided into two sections: a demographic section and the main part. The demographic section collected information on gender, age, sailing qualifications, and the respondents' years of sailing experience. The main part focused on questions related to sailing safety on the GMLR, including sailors' behavior, causes of accidents, waterway inspections, legal regulations and insurance, and the warning system for sailors.

Respondents indicated the type of sailing qualifications they held and their period of sailing experience. The surveys were conducted in person by the author, which allowed for clarification of any doubts.

Prior to the main study, the reliability of the questionnaire was assessed by administering it twice, with a one-month interval, to a group of 10 skippers.

Police Statistics

Statistical data on Police activities and incidents on waters and waterfront areas were obtained from the Head of the Social Communication Department of the Provincial Police Headquarters in Olsztyn, which supervises the activities of individual county Police stations within the GMLR area. The statistical data covered the period from May to September 2024.

Statistics of the Masurian Volunteer Rescue Service (MOPR)

Statistical data on rescue interventions and other activities of water rescuers were obtained from MOPR, based in Giżycko, upon request. The data cover the period from May to September 2024.

Statistical analysis

To analyze the collected survey results, a non-parametric test based on the chi-square function was used. Calculations were performed using the R software. The reliability of the questionnaire was assessed using the Kappa coefficient. A significance level of $p < 0.05$ was adopted. To compare skippers' behaviors, Fisher's exact test with Monte Carlo simulation (10,000 permutations) was applied. In cases of very strong associations, significance levels of $p < 0.01$ and $p < 0.0001$ were employed. For comparisons involving more than two groups and for the analysis of categorical data, the chi-square test of independence with a log-likelihood correction (G-test) was used.

Results

Pilot reliability study

The Kappa coefficient value for all the analyzed variables was equal to or higher than 0.92. No significant differences between the results obtained in the two tests were revealed ($p < 0.05$).

Analysis of Skippers' Opinions

In the first part, the behaviors of skippers affecting sailing safety were analyzed. More than half of the respondents (62.3%), regardless of the type of sailing license held, check the weather forecast before departing from the port. This activity is most frequently performed by yacht captains, less often by sea yacht helmsmen, and yacht sailors (83.3% vs. 65% vs. 62.3%). No statistically significant differences were found between checking the weather forecast and the type of sailing license ($p > 0.05$). Weather forecasts are most often ignored by sailors with the least experience (24.8%). As sailing experience increases, the number of sailors who do not check the weather forecast decreases ($p < 0.0001$) (Tab. 2).

More than 66% of respondents do not consume alcohol while sailing, whereas 14.4% admitted to drinking alcohol while sailing. The largest group abstaining from alcohol during sailing trips are yacht captains (83.3%). With increasing sailing experience, the percentage of individuals declaring alcohol consumption at the helm or doing so occasionally decreases; however, this difference is not statistically significant ($p > 0.05$) (Tab. 2).

When asked about voluntary liability insurance (LI), the vast majority of respondents (78%) stated that they do not purchase such insurance. None of the respondents holding a yacht captain's license carry liability insurance. The groups most frequently purchasing insurance are yacht sailors (10.4%) and individuals without sailing qualifications (25%). No statistically significant differences were found in terms of voluntary liabi-

Table 2. Skipper behaviors during sailing trips, taking into account experience and sailing qualifications (n = 313)

	Qualifications								p	Experience (years)								p	Total	
	YS		SYH		YC		NQ			Up to 10		11-20		21-30		31 and more			n	%
	n	%	n	%	n	%	n	%		n	%	n	%	n	%					
Checking the weather forecast before leaving port																				
Yes	114	62.3	78	65.0	5	83.3	2	50.0	ns	28	27.7	49	72.1	98	88.3	24	72.7	0.0001	199	63.6
No	29	15.8	11	9.2	1	16.7	1	25.0		25	24.8	6	8.8	9	8.1	2	6.1		42	13.4
Sometimes	40	21.9	31	25.8	0	0.0	1	25.0		48	47.5	13	19.1	4	3.6	7	21.2		72	23.0
Yes	24	13.1	19	15.8	1	16.7	1	25.0	ns	15	14.9	12	17.6	16	14.4	2	6.1	ns	45	14.4
No	123	67.2	78	65.0	5	83.3	3	75.0		64	63.4	43	63.2	74	66.7	28	84.8		209	66.8
Sometimes	36	19.7	23	19.2	0	0.0	0	0.0		22	21.8	13	19.1	21	18.9	3	9.1		59	18.8
Taking out liability insurance																				
Yes - always	19	10.4	5	4.2	0	0.0	1	25.0	ns	25	24.8	0	0.0	0	0.0	0	0.0	0.0001	25	8.0
Yes - sometimes	26	14.2	17	14.2	0	0.0	1	25.0		32	31.7	12	17.6	0	0.0	0	0.0		44	14.1
I don't take it out	138	75.4	98	81.7	6	100	2	50.0		44	43.6	56	82.4	111	100	33	100		244	78.0

YS – Yacht Sailor, SYH – Sea Yacht Helmsman, YC – Yacht Captain, NQ – no qualifications, ns – no statistically significant differences.

lity insurance regardless of the type of sailing license held ($p > 0.05$). With increasing experience, the number of sailors purchasing insurance decreases ($p < 0.0001$) (Tab. 2).

The factors most frequently feared by sailors during sailing trips are sudden changes in weather conditions and the dangerous behavior of motorboat and jet ski operators (79.2% vs. 47.3%). The groups least concerned about weather changes are yacht captains (16.7%) and individuals with less than 10 years of sailing experience (69.3%). The behavior of other sailors on the water is most often feared by skippers with both the least and the greatest experience ($p < 0.01$) (Tab. 3).

The most common dangerous situations experienced by yacht skippers on the water included collisions in the port (10.5%), crew members falling overboard (5.8%), and collisions with other yachts (5.4%). Less frequently reported incidents were mast breakage and yacht capsizing (both 4.8%). These situations occurred among all skippers, regardless of their level of experience (Tab. 3).

One in five respondents (21.7%) reported being inspected by the Police, while the Inland Navigation Inspectorate (INI) carried out inspections of 4.8% of those surveyed. Both services conducted inspections in the case of 12.5% of respondents (Tab. 3).

Nearly half (49.5%) of the participants, regardless of their sailing qualifications or experience, believe that changes to the legal regulations permitting the operation of sailing yachts up to 7.5 meters in hull length without a license are justified. The strongest supporters of such legal changes are sea yacht helmsmen (59.2%) and individuals currently benefitting from the regulation, who operate yachts without holding a sailing license (75%). In contrast, yacht captains are strongly opposed to these changes ($p < 0.001$). The proportion of supporters for modifying the legal regulations decreases with sailing experience ($p < 0.001$) (Tab. 4).

Respondents were also asked about the option of taking the sailing license exam without the obligation to participate in sailing training. More than 57% of sailors stated that this situation requires change. This opinion was most frequently expressed by

sea yacht helmsmen (60%), yacht sailors (57.9%), and individuals with 21-30 years of sailing experience (80.2%).

Regarding potential improvements to sailing safety on the Great Masurian Lakes Route, the most common suggestions included the introduction of a universal and free warning-information application (55%) and the need to increase the number of inspections conducted by the relevant services on the water (28.1%) (Tab. 4).

An analysis was conducted of respondents' self-assessment regarding their knowledge of sailing regulations. Half of the surveyed individuals rated their knowledge as good (50.2%), while nearly one-third (32.3%) considered it very good. The highest self-assessments were recorded among yacht sailors (35%) and individuals without sailing licenses (50%). Only 3.3% of yacht sailors rated their knowledge as low ($p < 0.01$) (Tab. 4).

Analysis of police statistics from the Warmian-Masurian Garrison

According to statistics maintained by the Warmian-Masurian garrison, in 2024 a total of 1,877 patrols were carried out on water and waterfront areas, including 97 in cooperation with external entities. During these operations, 1,981 interventions were conducted. Police officers performed 2,692 sobriety tests, detaining both intoxicated operators of motorboats and those steering non-motorized vessels. A total of 23 collisions on the water and 2 accidents resulting in injuries were recorded. Altogether, 2,170 offenses were identified, 877 fines were issued, and 54 cases were referred to court. During 18 rescue operations, 1 drowning person was saved. Preventive activities also included the inspection of 6,295 bathing sites (Tab. 5).

Analysis of MOPR statistics

Data from the MOPR 2024 report indicate that 76 joint operations were conducted in cooperation with other services. Preventive activities and safety briefings also play an important role in MOPR's work. These were conducted at summer camps and waterfront programs, particularly for children and youth, totaling 96 events. In addition, MOPR provided safety support during regattas and other events (68). The most critical activities from the perspective of water safety are rescue operations. In 2024, MOPR intervened 348 times, assisting nearly one tho-

Table 3. Concerns and situations experienced by skippers during sailing trips, taking into account their experience and sailing qualifications (n = 313)

	Qualifications								p	Experience (years)								p	Total	
	YS		SYH		YC		NQ			Up to 10		11-20		21-30		31 and more				
	n	%	n	%	n	%	n	%		n	%	n	%	n	%	n	%		n	%
Factors that skippers fear during sailing trips																				
Weather change	154	84.2	90	75.0	1	16.7	3	75.0	0.01	70	69.3	50	73.5	99	89.2	29	87.9	ns	248	79.2
Technical failure	34	18.6	41	34.2	2	33.3	0	0.0	0.01	23	22.8	12	17.6	33	29.7	9	27.3	ns	77	24.6
Behavior of sailors	44	24.0	51	42.5	3	50.0	1	25.0	0.05	29	28.7	18	26.5	40	36.0	12	36.4	ns	99	31.6
Movement of motorboats	86	47.0	59	49.2	2	33.3	1	25.0	ns	36	35.6	29	42.6	70	63.1	13	39.4	0.01	148	47.3
Crew errors	44	24.0	24	20.0	0	0.0	1	25.0	0.05	19	18.8	13	19.1	28	25.2	9	27.3	ns	69	22.0
Route marking	12	6.6	9	7.5	1	16.7	0	0.0	ns	9	8.9	5	7.4	7	6.3	1	3.0	ns	22	7.0
Congestion on the water	13	7.1	14	11.7	0	0.0	1	25.0	ns	12	11.9	9	13.2	5	4.5	2	6.1	ns	28	8.9
Other	7	3.8	5	4.2	0	0.0	0	0.0	ns	6	5.9	4	5.9	1	0.9	1	3.0	ns	12	9.3
No concerns	9	4.9	6	5.0	3	50.0	1	25.0	0.01	16	15.8	0	0.0	2	1.8	1	3.0	ns	19	6.1
Situations experienced by skippers during sailing trips																				
Yacht capsize	9	4.9	5	4.2	0	0.0	1	25.0	ns	5	5.0	5	7.4	4	3.6	1	3.0	ns	15	4.8
Crew member overboard	10	5.5	7	5.8	1	16.7	0	0.0	ns	5	5.0	3	4.4	7	6.3	3	9.1	ns	18	5.8
Mast breakage	9	4.9	6	5.0	0	0.0	0	0.0	ns	5	5.0	2	2.9	6	5.4	2	6.1	ns	15	4.8
Collision on the water	12	6.6	5	4.2	0	0.0	0	0.0	ns	5	5.0	3	4.4	7	6.3	2	6.1	ns	17	5.4
Collision in the port	22	12.0	11	9.2	0	0.0	0	0.0	ns	8	7.9	9	13.2	12	10.8	4	12.1	ns	33	10.5
Collision with a motorboat	8	4.4	3	2.5	2	33.3	1	25.0	0.05	7	6.9	0	0.0	5	4.5	2	6.1	ns	14	4.5
Theft of equipment	5	2.7	3	2.5	1	16.7	0	0.0	ns	2	2.0	3	4.4	3	2.7	1	3.0	ns	9	2.9
Other	4	2.2	0	0.0	0	0.0	0	0.0	ns	2	2.0	0	0.0	2	1.8	0	0.0	ns	4	1.3
No such experiences	111	60.7	87	72.5	3	50.0	2	50.0	ns	70	69.3	44	64.7	67	60.0	22	66.7	ns	203	64.9
Being controlled by Water Police or Inland Navigation Inspectorate																				
Police	46	25.1	21	17.5	1	16.7	0	0.0	0.001	8	7.9	2	2.9	42	37.8	16	48.5	0.001	68	21.7
INI	10	5.5	5	4.2	0	0.0	0	0.0		0	0.0	0	0.0	12	10.8	3	9.1		15	4.8
Police and INI	25	13.7	10	8.3	4	66.6	0	0.0		5	5.0	3	4.4	17	15.3	14	42.4		39	12.5
No control	102	55.7	84	70.0	1	16.7	4	100		88	87.1	63	92.6	40	36.0	0	0.0		191	61.0

YS – Yacht Sailor, SYH – Sea Yacht Helmsman, YC – Yacht Captain, NQ – no qualifications, ns – no statistically significant differences, INI – Inland Navigation Inspectorate.

usand individuals, of whom 25 required hospitalization and 12 died. Rescuers also responded to 16 yacht capsizes and carried out 195 technical operations, providing assistance to sailors and other water users (Tab. 6).

Discussion

The aim of this study was to explore the experiences of skippers with varying levels of qualifications regarding the factors determining sailing safety, including the training system, applicable legal regulations, and skippers' behavior, as well as to examine Police and MOPR statistics concerning incidents involving yachts navigating the Great Masurian Lakes Route.

One of the main causes of accidents and other dangerous situations on the water is sudden changes in weather conditions. However, the survey results show that 13.4% of respondents do not check the weather forecast before departing from the port, and an even larger group (23%) does so only occasionally. The least likely to check the weather forecast are sailors with the shortest sailing experience.

Failure to check the weather forecast and ignoring warning signals have been common factors in many incidents that have occurred in the Masurian region over the past several years. A recent example is the storm that struck the Masurian Lakes on July 28, 2024, capsizing five yachts and pushing several others into reeds and onto rocks. One sailor drowned. The forecast

Table 4. Assessment of safety and knowledge of sailing regulations, taking into account age, experience, and sailing qualifications (n = 313)

	Qualifications								p	Experience (years)								p	Total	
	YS		SYH		YC		NQ			Up to 10		11-20		21-30		31 and more				
	n	%	n	%	n	%	n	%		n	%	n	%	n	%	n	%		n	%
Justification for changing regulations regarding sailing without qualifications																				
Yes	80	43.7	71	59.2	1	16.7	3	75.0	0.001	68	67.3	54	79.4	27	24.3	6	18.2	0.001	155	49.5
No - they are correct	27	14.8	15	12.5	1	16.7	0	0.0		3	3.0	2	2.9	32	28.8	6	18.2		43	13.7
No - they are not enforced	46	25.1	20	16.7	0	0.0	0	0.0		12	11.9	4	5.9	37	33.3	13	39.4		66	21.1
I have no opinion	30	16.4	14	11.7	4	66.7	1	25.0		18	17.8	8	11.8	15	13.5	8	24.2		49	15.7
Justification for changing the sailing training system																				
Yes	106	57.9	72	60.0	1	16.7	0	0.0	0.01	21	20.8	50	73.5	89	80.2	19	57.6	0.001	179	57.2
No	59	32.2	39	32.5	1	16.7	3	75.0		67	66.3	18	26.5	11	9.9	6	18.2		102	32.6
I have no opinion	18	9.8	9	7.5	4	66.7	1	25.0		13	12.9	0	0.0	11	9.9	8	24.2		32	10.2
Improving sailing safety on the Great Masurian Lakes Route																				
Warning masts	24	13.1	14	11.7	1	16.7	0	0.0	ns	9	8.9	9	13.2	16	14.4	5	15.2	ns	39	12.5
Warning app	98	53.6	70	58.3	2	33.3	2	50.0	ns	72	71.3	44	64.7	45	40.5	11	33.3	0.05	172	55.0
Increase in the number of inspections	55	30.1	29	24.2	3	50.0	1	25.0	0.05	16	15.8	17	25.0	38	34.2	17	51.5	ns	88	28.1
Signage improvement	33	18.0	13	10.8	1	16.7	1	25.0	0.001	32	31.7	5	7.4	8	7.2	3	9.1	0.05	48	15.3
TPFNS	29	15.8	13	10.8	0	0.0	2	50.0	0.01	36	35.6	8	11.8	0	0.0	0	0.0	ns	44	14.1
I have no opinion	13	7.1	10	8.3	1	16.7	0	0.0	ns	4	4.0	1	1.5	18	16.2	2	6.1	ns	25	8.0
Assessment of knowledge on sailing regulations																				
Very good	64	35.0	34	28.3	1	16.7	2	50.0	0.01	61	60.4	18	26.5	17	15.3	5	15.2	ns	101	32.3
Good	84	45.9	69	57.5	3	50.0	1	25.0		32	31.7	42	61.8	63	56.8	20	60.6		157	50.2
Average	23	12.6	14	11.7	1	16.7	0	0.0		6	5.9	6	8.8	20	18.0	6	18.2		38	12.1
Poor	6	3.3	0	0.0	0	0.0	0	0.0		0	0.0	0	0.0	4	3.6	2	6.1		6	1.9
I have no opinion	6	3.3	3	2.5	1	16.7	1	25.0		2	2.0	2	2.9	7	6.3	0	0.0		11	3.5

YS – Yacht Sailor, SYH – Sea Yacht Helmsman, YC – Yacht Captain, NQ – no qualifications, TPFNS – transitional period for new sailors.

Table 5. Interventions and tasks carried out by the Warmian-Masurian Police garrison in 2024

Interventions and tasks	n	Interventions and tasks	n
Patrols on waters and waterfront areas	1877	Accidents on the water (with injuries)	2
Patrols with external entities (e.g., WOPR)	97	Collisions and accidents caused by intoxicated skippers	2
Interventions on waters and waterfront areas	1981	Total identified infractions	2170
Verified individuals on waters and waterfront areas	3298	Fines issued	877
Apprehended intoxicated skippers of motorboats (Art. 178A of the Penal Code)	15	Warnings issued	1239
Apprehended intoxicated skippers of motorboats (Art. 87§1 of the Misdemeanor Code)	11	Court referrals	54
Identified intoxicated individuals on vessels not classified as motor vehicles	66	Rescue operations conducted	18
Sobriety tests	2692	Number of rescued drowning persons	1
Collisions on the water	23	Number of inspected swimming areas	6295

Art. 178a of the Penal Code – state of intoxication (more than 0.5 ‰ blood alcohol content); Art. 87§1 of the Misdemeanor Code – state after alcohol consumption (0.2-0.5 ‰ blood alcohol content).

Table 6. MOPR intervention report on the Masurian Lake District in 2024

Number and type of interventions	n
Number of MOPR interventions	348
Injured individuals	979
Individuals who received assistance	969
Individuals hospitalized	25
Deaths	12
Capsizes	16
Technical operations	195
Regatta safety support	52
Event safety support	16
Search operations	12
Safety briefings	94
Joint operations with the Police	39
Joint operations with the State Fire Service	35
Joint operations with the Air Ambulance Service	2

change in weather had been announced a day earlier, and on the day of the storm sailors also ignored the flashing warning signals [30].

Another issue analyzed in the study was the consumption of alcohol by skippers during sailing trips. The vast majority of respondents stated that they do not drink alcohol while sailing, with only 14.4% admitting to doing so. Occasional alcohol consumption was reported by 18.8% of participants. Meanwhile, statistics from the Masurian Police show that in 2024 alone, 66 cases of intoxicated individuals were recorded on vessels not classified as motorized, and two skippers caused accidents and collisions on the water (Tab. 5). The report “Safety in Masuria” from 2020, based on data obtained from county police stations operating along the Great Masurian Lakes Route, also confirmed numerous such cases, with 48 incidents recorded [31]. As can be seen, the tightening of legal regulations in 2015, which lowered the permissible blood alcohol content as defined in the Act on the Safety of Persons Staying in Water Areas [32], has not eliminated this problem.

The respondents reported that they do not purchase voluntary liability insurance (LI) when sailing, with 78% giving this answer. Only 8% stated that they insure themselves every time.

Skippers are not infallible or error-free. Situations such as mast breakage or loss of maneuverability in the port, resulting in damage to other vessels, occur frequently. While damage most often concerns equipment, there are also cases of injuries causing harm to people. A good example to follow can be found in Croatia and some regions of Italy, where liability insurance is mandatory [33].

The largest group of sailors (79.2%) expressed fear of sudden weather changes. Nevertheless, as shown above, only 63.6% of them check the weather forecast before departing from the port. Recurring accidents that occur each year during the sailing season demonstrate that the approach to weather cannot end with concern alone. Respondents were also worried about the dangerous behavior of motorboats. Police statistics (Tab. 5) confirm these concerns: motorboat operators are found to be sailing when intoxicated (more than 0.5 ‰ blood alcohol content) or after alcohol consumption (0.2-0.5 ‰ blood alcohol content),

and their reckless behavior results in numerous fines and court referrals.

Various dangerous situations personally experienced by respondents – such as collisions in ports and on the water, yacht capsizing, mast breakage, or crew members falling overboard – show that much remains to be done in the field of inland yacht sailing safety. In successive years, statistics continued to report numerous collisions, accidents, and other dangerous incidents in which sailors received assistance from the Police and MOPR (348 interventions and 198 technical operations) (Tab. 6).

A large proportion of respondents (61%) reported that they had never experienced an inspection by the Police or the Inland Navigation Inspectorate (INI) during their sailing careers, while 21.7% stated they had been inspected by the Police. Police statistics from 2024 indicate a high number of interventions on water and waterfront areas (1,981) as well as sobriety checks (2,692). It can be assumed that motorboats are inspected much more frequently, which may explain why such a large group of sailors has never been subjected to inspection.

The regulations in the Polish legal system concerning the requirement to hold a license for operating sailing yachts, as well as the issue of mandatory sailing training, may raise significant controversy. A group of 49.5% of respondents believe that the provisions allowing yachts up to 7.5 meters in hull length to be operated without a license should be changed, while 57.2% consider it necessary to amend the regulations eliminating the obligation to undergo mandatory sailing training.

As noted by Petryński et al. [34], yachts of this size typically weigh around 2 tons and can carry crews of up to 8 people, representing a very large proportion of the sailing yachts operating on inland waters. This means that a considerable number of sailors navigating such vessels are not required either to complete training or to hold sailing licenses. The authors argue that these regulations are unrelated to sailing safety. The option of taking only a sailing exam – sometimes held under light wind conditions – does not guarantee that a candidate will behave appropriately in more demanding situations. Only professional training for sailors can ensure an adequate level of safety.

Sailing training is inseparably linked to the knowledge of navigation regulations, which respondents subjectively assessed as very good or good (32.3% vs. 53.2%). These results and sailors’ self-assessment should be regarded as requiring further investigation. This is supported by the consistently high number of dangerous incidents on the water and violations of applicable regulations recorded annually in Police and MOPR statistics (Tab. 5 and 6), caused by both sailing yacht and motorboat operators.

According to the Water Police, 95% of sailors in the Masurian region are unfamiliar with current regulations, with the most common violation being failure to yield the right of way [35]. The authors of the 2021 report “Safety in Masuria” noted 40 such cases during the study period, although this number may be underestimated, as collisions are usually reported only when yachts sustain significant damage [36].

Limitations and strengths of the study

The results presented in this study reflect the subjective assessments of sailors. The reliability of the applied questionnaire was evaluated, with the Kappa coefficient for all analyzed variables equal to or exceeding 0.92, indicating high validity of the tool and reliability of the collected data. This provided a solid basis for the analysis of the material obtained. The present study was limited to the Great Masurian Lakes region; future research should extend the scope to include other inland waters. Given the importance of the subject, further comprehensive studies

are warranted. A strength of this study lies in the large research sample ($n = 313$), which encompassed a wide range of sailing experience (from less than 10 to more than 31 years) as well as all possible sailing licenses. This allowed for a more complete depiction of the issue under investigation. For more precise comparative analyses between sailors with different types of licenses, future research should ensure a more balanced distribution of respondents across individual groups.

The issue of yacht sailing safety has been analyzed primarily in studies concerning maritime accidents. To the author's knowledge, this is the first study to examine the safety of yacht sailing on the Great Masurian Lakes Route, going beyond the analysis of legal regulations to also include the opinions of sailors themselves as well as data from Police and MOPR interventions.

Conclusions

1. One in three respondents (32.3%) rated their knowledge of navigation regulations as very good, while more than 50% considered it good. Nearly half of yacht skippers (49.5%) viewed changes in the legal provisions allowing the operation of sailing yachts up to 7.5 meters without a license as justified, and 57.2% indicated the need for mandatory sailing training prior to taking the exam.
2. According to yacht skippers – regardless of their experience or qualifications – checking the weather before departing from the port and responding appropriately to changing conditions and warning signals are the main factors determining sailing safety. More than half of respondents (55%) see the need for the introduction of a universal and free warning-information application for sailors.
3. More than 14% of sailors consume alcohol during sailing trips, and 18.8% declare that they do so occasionally. The vast majority (78%) do not purchase liability insurance for sailors.
4. Police and MOPR data from 2024 alone indicate numerous interventions and incidents on the water, as well as violations of legal regulations. Despite extensive sobriety checks (2,692), sailing when intoxicated or after alcohol consumption remains a significant problem.

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