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MAPPING OF RECREATIONAL CRAFT ACCIDENTS

MAIN REPORT

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Photo of ferry on the Norwegian west coast: Bente Amandussen

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Unless otherwise stated, all tables and graphs are created by the AIBN.

SUMMARY

Boating is an activity undertaken by people of all ages and backgrounds. Every year, almost 2.3 million Norwegians spend time on board recreational craft at sea. There are more than 900,000 recreational craft in Norway. Lack of knowledge has made it difficult for public authorities, special interest organisations and users of recreational craft to assess appropriate and targeted measures to effectively prevent recreational craft accidents.

The Accident Investigation Board Norway (AIBN) has carried out a mapping of recreational craft accidents in Norway.

The work entailed two main tasks. The first was to obtain relevant information about all fatal recreational craft accidents in 2018. The second was to collect historical data on recreational craft accidents, including non-fatal accidents. The main findings are set out in Chapter 2. The results are presented in two sub-reports.

The reports provide a more comprehensive and nuanced presentation of the circumstances surrounding recreational craft accidents than has previously been undertaken in Norway. The AIBN believes that the results will give the authorities and other organisations a better knowledge platform for assessing measures to improve safety at sea. They also forms a basis for considering what types of accidents should be investigated by the AIBN in future.

The total number of recreational craft accidents showed an increasing trend during the period 2008–2017. The increase is mainly due to an increase in the number of motorboat accidents. It is primarily the number of propulsion loss incidents (engine failure etc.) and groundings that have increased for this type of craft, which, in turn, may have to do with the increase in the number of motorboats.

The number of fatalities during the same decade was 367. The results show a slightly falling trend.

In 2018, 23 people died in recreational craft accidents. Three people were seriously injured. In total, 44 people and 22 recreational craft were involved in accidents in which one or more people died. This was fewer than in previous years. The lower figure may be due to inaccuracies relating to previous years' classification of incidents as recreational craft accidents.

Half of those who died in 2018 drowned after the boat capsized or after falling overboard. In most cases, it took a long time, more than 45 minutes, for others to realize that they were in need. Hypothermia was probably a contributory cause to their drowning. Given medical treatment, victims of hypothermia can sometimes be resuscitated, but under the condition that their airways have been kept clear during the cooling. An immediate distress alert with indication of position, combined with the use of a properly fitted lifejacket and clothing that delays the onset of hypothermia, can help to keep a person alive in the water. These types of accidents were also associated with the highest number of fatalities during the preceding decade.

One in four who died in 2018 were foreign tourists in rented boats. After comparing the results of this mapping with a previous investigation and supervisory report from the Directorate for Civil Protection and Emergency Planning (DSB), the AIBN questions whether boat rental firms devote sufficient attention to the safety of those who rent recreational craft. The number of foreign nationals who died was slightly higher in 2018 than during the preceding decade.

Groundings and collisions receive a great deal of attention, which may draw attention away from the fact that 80% of the victims in 2018 died under other circumstances. One in five victims in 2018

died after their boat ran aground or collided. These accidents had three factors in common: high speed, moderate to heavy intoxication and twilight conditions. To be able to implement targeted measures, the AIBN believes it is necessary to have more knowledge about why people operate boats when they are moderately to severely intoxicated. Results from the past decade show that groundings, collisions and allisions occurred frequently, but that only a small proportion of these incidents were fatal. Those who died in these types of accidents were generally younger than the victims of other types of accidents.

One in five victims in 2018 died after falling into the water between the moored craft and the floating jetty. Most victims were severely intoxicated, which may have contributed to why they fell into the water, had limited possibility of raising the alert and of self-rescue. Most of them were not wearing a flotation device. Because of uncertainties in the data from previous years, they cannot be used to describe a trend for this type of accident.

The mapping has identified a potential for improvement in the Norwegian Maritime Authority's basis for keeping annual statistics on fatal recreational craft accidents. This requires improving the method used, post mortem examination of victims, obtaining more detailed information, such as from the joint rescue coordination centres and the police, and devoting more resources to analysis of the information. This will ensure that the statistics better reflect that different issues are relevant for different types of accidents.

The mapping has also identified the possibility of using and combining multiple sources to gain a more comprehensive overview of the number of accidents and serious incidents involving recreational craft in Norway each year. The results can be used to compare trends across years and help to identify targeted measures to improve safety at sea.

The AIBN does not propose any safety recommendations in connection with this mapping.

1. INTRODUCTION

In 2018, the AIBN carried out a mapping of recreational craft accidents in Norway. The goal was to give the authorities and other organisations a better basis for assessing measures to improve safety at sea. It will also forms a basis for deciding what types of accidents should be investigated by the AIBN in future.

The basis for AIBN's decision to initiate this work and a description of the main tasks involved are provided below.

1.1 Grounds for commencement of the mapping work

Boating is an activity undertaken by people of all ages and backgrounds. Almost 2.3 million Norwegians spent time on a recreational craft at sea in 2017, the vast majority on more than one occasion. The number of recreational craft has almost doubled since the late 1970s, and now numbers more than 900,000[1] (Prop. 51 L (2014–2015)), (KNBF, 2018).

During the same period, the number of people who died in recreational craft accidents has been more than halved, from almost 90 a year to just over 30[2] (Prop. 51 L (2014–2015)). The number of victims has not been significantly reduced over the past 25 years (Arbeidsgruppe for å utrede sikkerhet ved bruk av fritidsbåt, 2012) and (Sjøfartsdirektoratet, 2018).

One of the Government's focus areas set out in the National Transport Plan 2018–2029 (Meld. St. 33 (2016–2017)) is to increase preventive efforts in relation to recreational craft. Section 10.5 of the white paper states that the number of accidents associated with the use of recreational craft is too high. In line with the zero vision, the Government aims to reduce risks associated with the use of recreational craft. It will consider different measures based on their risk-reduction potential and socio-economic profitability. The Government wants greater emphasis on knowledge about recreational craft accidents, including the causes of such accidents. An increase in appropriations for the AIBN means that funds are also available for investigating recreational craft accidents.

The Norwegian Institute of Public Health's reports on accidents and injuries in Norway (*Skadebildet i Norge* (Myklestad, et al., 2014) and (Ohm, Madsen, & Alver, 2019)) emphasises that, despite a significant reduction in the number of fatal accidents in the past 40 years, injuries resulting from accidents still constitute a major challenge to public health. Accidents have serious consequences for the individuals involved and for society. Accidents are the leading cause of death among people under 45 years. About 540,000 people are injured[3] in Norway each year. Approximately 2,500 die as a result of their injuries. Three of four of these were accidents, while the remaining were mostly self-killing. Annually more than 100,000 people sustain injuries that require treatment by the specialist health service (Ohm, Madsen, & Alver, 2019). The reports emphasise that there are sizeable gaps in our current knowledge about accidents and injuries. Although some sectors have own systems in place for registering injuries, these are often inadequate and of poor quality. The Institute of Public Health and the other contributors believe that it is

[1] In this report, the term recreational craft means all vessels less than 24 metres long that are not in commercial use. This includes canoes, kayaks, rowing boats, water scooters, small and large motorboats and sailing boats.
[2] The number does not include swimming accidents, illness or suicides.
[3] Injuries resulting from accidents, injuries resulting from violence and self-inflicted injuries.

possible to do more to prevent injuries and deaths, with great potential health benefits for the population. Reliable statistics will form a cornerstone in the continued work and form the basis for knowledge about injuries and accidents. Up-to-date knowledge is necessary to be able to plan preventive public health work.

The Norwegian Maritime Authority (NMA) has kept statistics on the number of fatal recreational craft accidents since 1981. At year-end 2017, the statistics included information about the number of fatalities, type of accident, type of craft, type of waters, nationality, age and gender. The statistics indicate whether flotation devices were used, but not what kind. The statistics also indicate whether the operator was intoxicated, but not the level of intoxication or what substance they were under the influence of. For groundings and collisions, there is no indication of assumed speed at the time of the accident. The information has been obtained from the media and from police reports. Since autumn 2017, the NMA has improved the reporting form and strengthened the follow-up of the reports from the police. The AIBN believes that this will improve the statistical basis, but that information about the circumstances and causes of accidents will still be inadequate, despite these improvements.

No comprehensive overview is kept of the scope of recreational craft accidents in Norway through the year. The joint rescue coordination centres (JRCC) coordinate and lead the search and rescue services[4] and keep a log of their operations. The Norwegian Society for Sea Rescue (RS) keeps statistics on the number of people they rescue, the number of people they assist, the number of vessels they salvage and tow, and the total number of assignments they carry out. Neither JRCC nor RS's statistics have specified whether the incidents occurred in connection with the use of recreational craft, or whether they were accidents or near-accidents involving an immediate risk. The AIBN is not aware that information from these two sources has ever been combined.

The statistics on the number of people treated by the specialist health service do not specify whether the injury resulted from the use of a recreational craft or from other recreational activities (Myklestad, et al., 2014). Nor are statistics available on recreational injuries (including the use of recreational craft) treated by the primary health service.

The Norwegian Society for Sea Rescue keeps statistics on drowning in Norway. In the last few years, the number of drownings has been around one hundred a year (Redningsselskapet, 2019). The figures include all types of accidents in which someone has drowned, and 72% of the drownings are not related to the use of recreational craft (Ohm, Madsen & Alver, 2019). Half of all drownings occur after a person falls from land or a quay into a river, lake or the sea. The statistics also includes cars that end up in the water/sea and accidents that occur in connection with swimming, diving etc. The statistics are not limited to recreational activities, but also include drowning accidents that occur in connection with commercial activities, such as people falling overboard from fishing vessels (Redningsselskapet, 2019).

The Ministry of Trade and Industry appointed in 2011 a working group tasked with assessing safety in connection with the use of recreational craft in a wide perspective and proposing measures to improve safety (Arbeidsgruppe for å utrede sikkerhet ved bruk av

[4] The public rescue service is organised as a collaboration between public agencies, private and non-profit organisations. The two joint rescue coordination centres are charged with coordinating and leading rescue operations. In addition, there are 12 local rescue coordination centres (LRCC), corresponding to the number of police districts (including the Governor of Svalbard).

fritidsbåt, 2012). The report compared the number of fatal recreational craft accidents in Norway and other Nordic countries and the USA. The estimates showed that, in relation to the number of recreational craft, the risk of dying in an accident with a recreational craft is lowest in Norway. Investigations of accidents in the USA are considered good, but with limited transfer value for Norwegian conditions. Investigations carried out in Sweden, Finland and Denmark are considered to have greater transfer value.

The Institute of Transport Economics has estimated the risk of sustaining personal injuries in connection with the use of recreational craft (Bjørnskau & Amundsen, 2017).The calculations were based on a questionnaire survey among owners of boats registered in the RS Småbåtregisteret (a pleasure craft register).[5] The report states that the risk of being injured in an accident is higher on board a recreational craft than in a passenger car. The risk of being injured in an accident is higher on a bike or motorcycle than it is on board a recreational craft.

In summary, this means that information has been limited about fatal recreational craft accidents. There has been no available overview of the number of recreational craft accidents in Norway per year. The lack of knowledge has made it difficult for public authorities, special interest organisations and users of recreational craft to assess appropriate and targeted measures to effectively prevent recreational craft accidents and monitor trends.

The Norwegian Maritime Code (Act of 24 June 1994 No 39) states that the AIBN shall determine whether to investigate recreational craft accidents. The AIBN conducts its investigations independently and decides on the scope of its investigations and how they are to be conducted. The general duty of all parties to disclose relevant information about the accident combined with the AIBN's duty of confidentiality gives it a unique mandate that complements the safety work of other public authorities, private parties and special interest organisations.

1.2 Description of the main tasks

This mapping has focused on two main tasks:

1) Obtaining and analysing relevant information about all fatal recreational craft accidents that occurred in 2018 (Statens havarikommisjon for transport, 2019, A).

2) Obtaining and analysing historical information about recreational craft accidents that occurred during the period 2008–2017, including non-fatal accidents (Statens havarikommisjon for transport, 2019, B).

The two main tasks differ significantly, and the approach, analysis and results are therefore presented in two different sub-reports. Chapter 2 summarises the conclusions that were drawn during work on the main tasks. The appendix to this document contains an overview of legislation of relevance to recreational craft and their use.

For recreational craft accidents involving one or more fatalities or missing persons presumed dead, the AIBN has collected information about them. The main sources of the

[5] It is voluntary to register pleasure craft with length less than 15 m in Norway. Such craft can be registered in the RS Småbåteregister or in the NMA's Ship Register NOR. Pleasure craft with length of 15 m and more are required to be registered in NMA's Ship Register NOR.

information have been police documents in the case, and JRCC and RS reports. The AIBN did not examine the scene of the accident and did not interview those involved or next of kin.

As part of its effort to get a comprehensive overview of the scope of recreational craft accidents in Norway, the AIBN obtained historical information from the past ten years from the JRCCs, RS and supplementary sources.

The mapping was geographically limited to Norwegian territorial waters along the mainland, in addition to lakes, rivers etc. The territorial waters around Svalbard were also included.

2. MAIN CONCLUSION

2.1 Trends in and types of recreational craft accidents during the past ten years

The average number of registered accidents/incidents involving recreational craft in the period 2008–2017 was approximately 1,200 per year. This number includes all types of recreational craft accidents, both fatal and non-fatal. The total number of recreational craft accidents shows an increasing trend during the decade; see Figure 1. The results show that motorboats dominate the accident statistics, followed by sailing boats. The trend is also increasing for kayaks/canoes and boards/kites, although the number of accidents is significantly lower than for motorboats and sailing boats.

The rising trend is primarily due to an increase in the number of motorboat accidents. This type of craft has been involved in an increasing number of propulsion loss incidents (engine failure, technical problems, rope in the propeller, running out of fuel etc.) and groundings, which, in turn, may have to do with the increase in the number of motorboats.

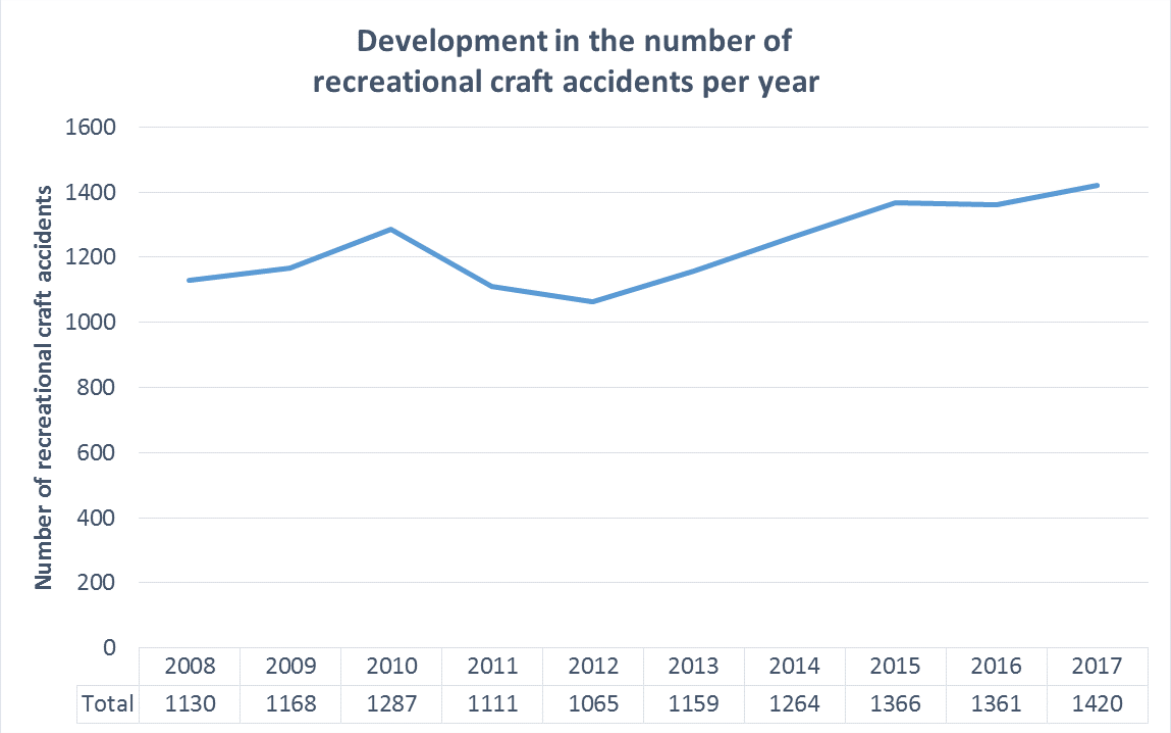

Figure 1: Development in the number of recreational craft per year.

Propulsion loss and grounding are the most frequently recorded types of accident in Norway, representing approximately 70% of the total.

Even though propulsion loss dominates the total number of accidents/incidents, have few of those led to fatal accidents. Without assistance, these incidents can become critical, for example if the craft drifts ashore. The data set contains little information about the causes of propulsion loss.

The number of recorded fatalities in the period 2008–2017 was 367. The results show a slightly falling trend.

Capsizing/foundering and person overboard incidents resulting in deaths are mainly recorded for motorboats and kayaks/canoes.

Most of the fatal accidents involve motorboats, except for incidents involving falls at quay or jetty, where information about the craft is missing in most cases. The results also show that there have been quite a few fatal accidents involving kayaks/canoes in addition to dinghies, rowing boats and sailing boats. Approximately 75% of motorboat accidents where the size is specified concern craft of less than 26 feet. This suggests that most fatal accidents occur on small craft.

2.2 Fatalities

2.2.1 Fatalities in 2018

Twenty-three people died in recreational craft accidents in 2018. Three people were seriously injured. In total, 44 people and 22 recreational craft were involved in accidents in which one or more people died.

Figure 2: Overview of fatal accident locations in 2018. Map: the Norwegian Coastal Administration's online map service Kystinfo. Illustration: AIBN

2.2.2 Development in the past decade

There were fewer fatalities in 2018 than in previous years; see Figure 3.

The lower figure may be partly due to inaccuracies relating to previous years' classification of incidents as recreational craft accidents. By obtaining more information about the incidents, such as information from the NMA's Ship Register, the police, the joint rescue coordination centres and other parties involved in search and rescue work, a clearer view of how to improve incident registration can be formed.

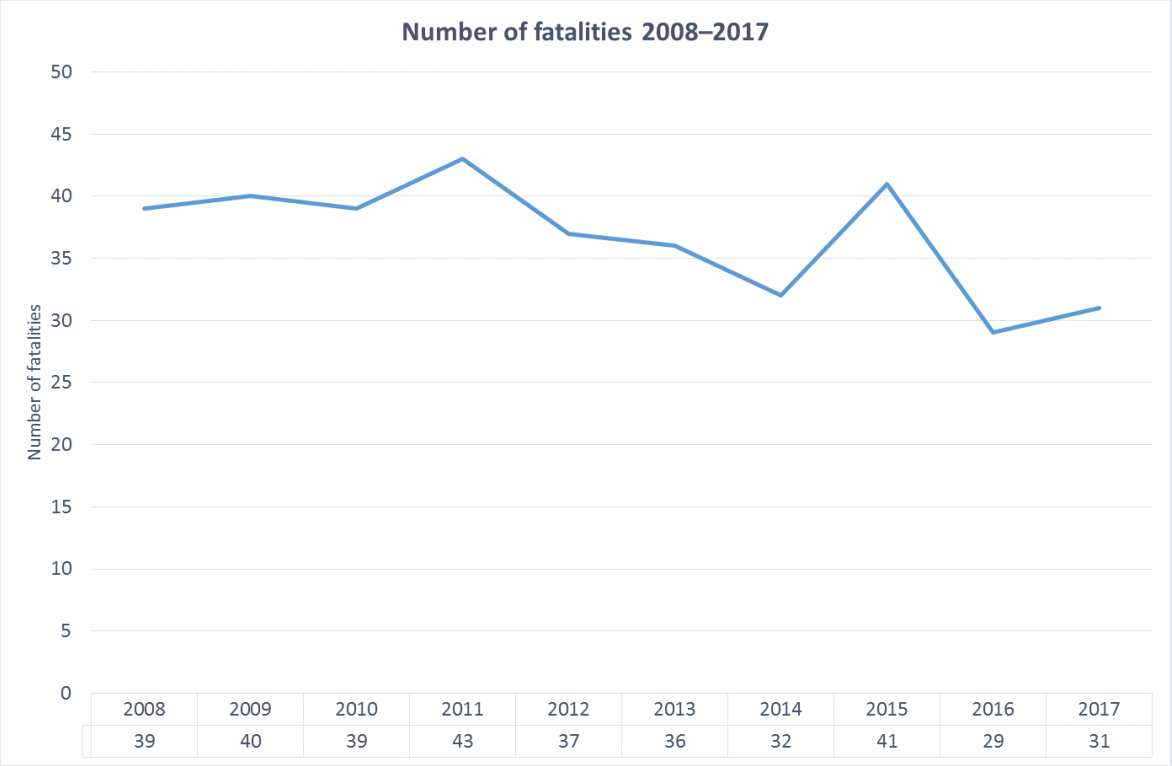

Figure 3: Number of fatalities 2008–2017.

A comparison between the accidents in 2018 and the historical data set, see Table 1, shows little correspondence in the percentage distribution of accident types. Expected year-on-year variations in fatal accident types and inaccuracies in the historical data go some way towards explaining this. Both sources show that most fatalities occur when people end up in the sea because their craft capsizes or because they fall overboard. Fewer people die as a result of grounding, collision with other craft or a jetty etc.

The historical data show that most accidents result from problems with the engine and steering system (propulsion loss), but that such accidents rarely result in fatalities. Many accidents also involve grounding, but relatively few of these result in fatalities.

Table 1: Breakdown of fatalities as percentage of total number of fatalities. Source: AIBN.

Type of accident	Fatalities 2018[6] [%]	Fatalities 2008–2017 [%]
Capsizing	30 (33)	23[7]
Person overboard	17 (19)	45
Fall between craft and jetty/quay	17 (19)	8
Grounding	9 (10)	10
Collision	9 (10)	4
Sudden illness	4 (5)	0
Fire	4 (0)	1
Missing	4 (5)	0
Other/unknown	4 (0)	2
Propulsion loss	0 (0)	3
Water ingress	0 (0)	3
Allision	0 (0)	1
Personal injury	0 (0)	0

2.3 Capsizing and person overboard accidents

2.3.1 Fatalities in 2018

Half of those who died (11 of 21[8]) in 2018 drowned after their craft capsized or after falling overboard.

Capsizing accidents involved small craft, primarily craft in motion (motorboat, dinghy, rowing boat, canoe, kayak and paddleboard). The speed of the craft did not exceed 10 knots. The motorboat, dinghy and rowing boat had a low freeboard that failed to meet current requirements, and their wind and sea limitations were unknown. Half of the accidents involved inexperienced foreign nationals who had borrowed or rented the craft, while the other half involved experienced Norwegian and foreign operators. The victims were probably not intoxicated.

The victims of person overboard accidents were adult men, mainly foreign nationals, who fell overboard while the motorboat or sailing boat they were in was under way. With one exception, the victims were probably not intoxicated. The accidents occurred in narrow

[6] Two fatal accidents that occurred in 2018 were not included in the mapping because the AIBN lacked sufficient information. The figures in brackets show a percentage breakdown of the accidents that were analysed.
[7] Capsizing and foundering.
[8] Two of the accidents are not included in the basis for the analysis due to insufficient information.

coastal waters. The AIBN has not identified any common factors to explain why they fell overboard.

For most of the capsizing and person overboard accidents, it took a long time, more than 45 minutes, before anyone else became aware of the distress situation. In most cases, the persons involved were unable to alert anyone of their distress by mobile phone and had no other means of notification available, such as a whistle, an emergency flare, a handheld VHF radio, a personal locator beacon or an AIS transponder with distress signal.

The shortest distance to the nearest shore, island or islet was between 100 and 600 metres. The temperature in the sea/water was between 6 and 16 °C. The persons involved were appropriately dressed to be on board a boat, but not to be in the water.

On the assumption that the victims retained buoyancy and clear airways during the first phase after falling into the sea/water, hypothermia probably contributed to their drowning. For those victims who were wearing flotation devices, the equipment was not properly fitted or was of a type that did not keep the airways clear, or the wearer lost consciousness or otherwise lost the ability to take care of themselves.

Given medical treatment, hypothermic patients can sometimes be resuscitated. A patient whose airways were clear while their temperature dropped until hypothermic cardiac arrest has a better chance of being successfully resuscitated.

A properly fitted lifejacket with the crotch strap attached is currently the only flotation device that will keep the airways clear if the wearer loses consciousness or otherwise becomes unable to take care of themselves.

An immediate distress alert with indication of position, combined with the use of a properly fitted lifejacket and clothing that delays the onset of hypothermia, can help to keep a person alive in the water.

There are currently various effective solutions available for sending out distress signals that also indicate position, and clothing that delays the onset of hypothermia.

2.3.2 Development in the past decade

The results show that 68% of all victims in the past ten years (2008-2017) died as a result of capsizing and person overboard accidents. These accident types lead most frequently to fatalities.

Capsizing/foundering accounted for 5% of all recreational craft accidents, and 23% of the victims of such accidents died. Although these are rare types of accidents, they often result in fatalities.

The same is observed for person overboard accidents. In the past decade, this type of accident accounted for 3% of all recreational craft accidents, and 45% of the victims of such accidents died. Person overboard accidents occur most frequently at night (16%). Although these are rare types of accidents, they often result in fatalities.

The available data on previous accidents are not sufficiently detailed to describe contributory factors to capsizing and person overboard accidents, or the extent to which flotation devices were used or the effect they may have had.

2.4 Boat rental for tourists

2.4.1 Fatalities in 2018

One in four fatalities (5 of 21) in 2018 were tourists in a rented craft. They died after the craft capsized or after falling overboard.

The tourists who died had little or no experience of the type of craft involved, the waters they were in or the prevailing weather and sea conditions.

In the capsizing accidents, the weather and sea conditions were challenging for inexperienced users of a canoe, kayak and motorboat, respectively.

After comparing the results of this mapping with a previous investigation and supervisory report from the Directorate for Civil Protection and Emergency Planning (DSB), the AIBN questions whether boat rental firms devote sufficient attention to the safety of those who rent recreational craft.

2.4.2 Development in the past decade

Rental or (fishing) tourism was recorded in 14% of the fatal accidents in the past five years (2013–2017). This is lower than the percentage in 2018. The number is so low that the figures cannot be used to indicate a trend.

A total of 15% of those who died in the past ten years (2008–2017) were foreign nationals. The figures do not specify whether they lived in Norway or were tourists. The proportion was lower than in 2018.

2.5 Groundings and collisions

2.5.1 Fatalities in 2018

Groundings and collisions receive a great deal of attention in the discussion on how to improve safety at sea, which can draw attention away from the fact that 80% of the victims in 2018 died under other circumstances.

One in five victims (4 of 21) in 2018 died when their craft ran aground or collided.

Groundings and collisions have three factors in common: high speed, moderate to heavy intoxication and twilight conditions. Weakened skills due to intoxication may have contributed to the accidents. Light conditions and the absence of navigation lights made it more difficult to predict dangers in twilight. The accidents have occurred suddenly and unexpectedly.

The accidents involved motorboats and water scooters. The speed of the craft usually exceeded 20 knots. For two of the cases, the speed is assumed to have exceeded 30 knots. In most of the cases, no speed limits applied to the waters where the accidents occurred. In the one case where a municipal speed limit did apply for the summer, the craft was travelling at a considerably higher speed than permitted. High speeds caused the persons

involved to suffer injuries. In two cases, the victims died from extensive injuries. The injuries suffered by the other two victims may have limited the possibility of self-rescue and caused them to drown. In one of these cases, the failure to use a flotation device may have limited the person's chances of surviving.

All the persons involved in such accidents were under 45 years of age, and 3 were teenagers. The groundings and collisions occurred as the victims were returning home from a night out. Needing to get home, they had planned or chose to return by sea rather than by some means of road transport. The craft operators were experienced boaters and familiar with the waters. Five out of six operators were intoxicated. Most were moderately to severely intoxicated. Their average blood alcohol concentration (BAC) was 0.14%, significantly higher than the current limit of 0.08%, and slightly higher than the average for drivers who die in road accidents.

Experience from the road traffic area shows that reducing the drink driving limit to a BAC of 0.02% can have a positive effect in the form of fewer injuries and fatal accidents. At the same time, experience from Scotland shows that reducing the drink driving limit does not necessarily reduce the number of accidents unless other measures are introduced at the same time, such as more frequent blood-alcohol testing by the police of recreational craft operators.

The question can be raised whether there are similarities and differences between those who drive a car under the influence and those who operate a boat under the influence. To be able to implement targeted measures, the AIBN believes it is necessary to gain a better understanding of why people choose to operate a boat while moderately to severely intoxicated.

2.5.2 Development in the past decade

In the past decade (2008–2017), groundings, collisions and allisions accounted for 36% of all recreational craft accidents, most of which were registered as groundings (34%). The number of groundings have increased since 2012. The same type of accidents accounted for approximately 15% of fatal accidents during the same period. This means that groundings, collisions and allisions occur frequently, but that only a small proportion of these incidents are fatal.

Groundings, collisions and allisions account for 44% of all accidents that occurred at night (between 00:00 and 06:00). There is no increase in the total number of accidents that occur at night. The data are not sufficiently detailed to indicate the extent to which other factors, such as the weather, intoxication, speed etc., have contributed to the accidents.

In 30% of the fatal accidents that occurred in the past five years (2013–2017), it was registered that some of those involved were intoxicated, but the data do not indicate who or the level of intoxication. Intoxication and high speed were registered as factors contributing to groundings, collisions and allisions significantly more often than was the case for other types of accident. The average age of those who died in these types of accidents (49 years for men and 33 years for women) was lower than for all types of accidents taken together.

2.6 Fall between moored craft and floating jetty

2.6.1 Fatalities in 2018

There may be greater uncertainty associated with the number of people who die on a recreational craft while it is moored, primarily because it is difficult to distinguish between these accidents and other accidents in which someone falls from a quay, jetty or shore.

One in five victims (4 of 21) in 2018 died as a result of falling overboard between the craft and a floating jetty.

Most of the accidents occurred at night after partying.

In most cases, the victims were severely intoxicated, which have contributed to why they fell into the water and had limited possibility of raising the alert and of self-rescue.

Only one of the victims wore a flotation device.

It took at least one hour before anyone else became aware of the distress situation.

Four people drowned, all aged over 50.

2.6.2 Development in the past decade

Information about situations in which someone falls between a craft and a jetty/quay is limited to fatal accidents. The figures show greater variation in the number of fatalities year on year, which supports the lesson learnt during the mapping in 2018 that it has been difficult to distinguish between this type of accident and other accidents that occur alongside shores, quays and jetties. The victims were registered as being intoxicated in nearly half of these accidents.

3. FURTHER WORK

The AIBN believes that the reports will give the authorities and other organisations a better knowledge platform for assessing measures to improve safety at sea. They also forms a basis for considering what types of accidents should be investigated by the AIBN in future.

The reports give a more comprehensive and nuanced presentation of the circumstances surrounding fatal recreational craft accidents than has previously been provided in Norway. There is potential for improvement in the Norwegian Maritime Authority's basis for keeping annual statistics on fatal recreational craft accidents. This requires improving the method used, post mortem examination of victims, obtaining more detailed information, such as from the joint rescue coordination centres and from the police, and devoting more resources to the analysis of information.

The mapping has also identified the possibility of using and combining multiple sources to gain a more comprehensive overview of the number of accidents and serious incidents involving recreational craft in Norway each year. The results can be used to compare trends across years and help to identify targeted measures to improve safety at sea. If the

NMA starts keeping combined statistics on recreational craft accidents year on year, a system must be devised whereby data from several parties can be collated through the use of defined parameters. Procedures should be established to ensure as comprehensive reporting of relevant incidents as possible. The registration system should contain functions for recording relevant information, both for the purpose of monitoring trends in recreational craft accidents and with a view towards establishing measures to reduce the number of recreational craft accidents.

4. SAFETY RECOMMENDATIONS

The AIBN does not propose any safety recommendations in connection with this mapping work.

Accident Investigation Board Norway

Lillestrøm, 27 March 2019

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APPENDIX

Appendix A: Relevant legislation

APPENDIX A: RELEVANT LEGISLATION

The report does not aim to describe in detail the requirements that apply to recreational craft, operators of and passengers on recreational craft, the rental of recreational craft or the supervision and control of recreational craft and their operators.

Relevant laws and regulations that apply to recreational craft are listed in Table 2 for reference purposes. The list is based on the Norwegian Maritime Authority's overview and includes a reference to the Rules of the Road at Sea (Sjøfartsdirektoratet, 2019).

Tourists renting a boat without a crew are covered by the general regulations for the use of recreational craft in Norway. What this means is described in DSB's thematic report (Direktortatet for samfunnssikkerhet og beredskap (DSB), 2012).

Rental firms hiring out recreational craft to, for example, tourists must comply with several other laws and regulations in addition to the Small Craft Act with pertaining regulations. They include the Product Control Act, the Internal Control Regulations and the Regulations relating to the construction, design and production of personal protective equipment. Recreational craft rental firms are responsible for ensuring the safety of those who hire a craft by implementing reasonable measures to avoid harm to health, and are also obliged to provide users of the service with sufficient, relevant information to enable them to assess safety. The Directorate for Civil Protection and Emergency Planning (DSB) is responsible for supervising recreational craft rental firms.

Table 2: Overview of the most relevant laws and regulations concerning recreational craft and their use.

Acts of law	• Act of 11 June 1976 No 79 relating to the control of products and consumer services (Product Control Act) • Act of 26 June 1998 No 47 relating to recreational and small craft (the Small Craft Act) • Act of 12 April 2013 No 13 on the free exchange of goods in the EEA (the EEA Goods Act)
Regulations	• Regulations of 1 December 1975 No 5 regarding preventing collisions at sea (Rules of the Road at Sea) • Regulations of 20 October 1983 No 1580 on safety precautions for gasfired installations, etc. operating on propane or other liquefied hydrocarbon gases used on board vessels (Regulations on Safety Precautions for Gasfired Installations) • Regulations of 8 May 1995 No 409 relating to flotation devices on board recreational craft • Regulations of 6 December 1996 No 1127 relating to systematic health, environment and safety activities in enterprises (Internal Control Regulations) • Regulations of 4 December 2001 No 1450 relating to maritime electrical installations • Regulations of 27 June 2008 No 744 on the obligation to notify and report marine accidents and other incidents at sea

	• Regulations of 3 March 2009 No 259 for minimum age and boating licence, etc. for masters of recreational craft • Regulations of 24 November 2009 No1400 on the operation of craft carrying 12 or fewer passengers etc. • Regulations of 30 May 2012 No 488 on environmental safety for ships and mobile offshore units • Regulations of 1 June 2014 No 931 relating to pollution control (the Pollution Regulations) • Regulations of 27 April 2015 No 409 on exemptions from the requirement for the use of flotation devices on recreational craft • Regulations of 15 January 2016 No 35 on the production and placing on the market of recreational craft etc. • Regulations of 22 June 2018 No 1019 on the construction, , design and production of personal protective equipment (PVU).

Relevant amendments to the regulations on CE marking, boating licences, instructions on the use of flotation devices and water scooters introduced after 2006:

- Since 16 June 1998, recreational craft have been subject to a requirement for CE marking. As of 1 January 2006, engines are also required to be CE-marked. The requirement applies throughout the EEA and shows that the product was manufactured in accordance with EU regulations. The manufacturer is responsible for CE marking. In the case of second-hand imported watercraft, the importer is responsible for CE-marking.

- A boating licence requirement was introduced in June 2009 for everyone born on 1 January 1980 or later for watercraft of more than eight metres in length with an output of more than 25 hp. A boating licence entitles the holder to operate a recreational craft of up to 15 metres in length without further limitations. Persons born before 1980 are exempt from the boating licence requirement, and may operate vessels of up to 15 metres in length without a qualification document. Persons under the age of 16 may operate a recreational craft if the vessel is less than 8 metres in length, has an output of maximum 10 hp and a maximum speed of 10 knots.

- The use of appropriate floating devices on recreational craft became mandatory on 1 May 2015. It applies to everyone on board recreational craft of up to eight metres in length. An appropriate floating device must be worn on open decks while the craft is moving. By appropriate floating device is meant lifejacket, buoyancy vest, buoyancy clothing, flotation aid or other personal floatation device. The device must either have CE marking or a mark of conformity.

- In May 2017, water scooters were given equivalent status as other coastal and inland watercraft. If required, individual municipalities may adopt local regulations on the use of watercraft, including water scooters, in coastal and inland waters.