

CALIFORNIA BOATING ACCIDENT REPORT FOR 1994

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF BOATING AND WATERWAYS

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JULY 1995

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July 1995

Dear Boating Enthusiast:

The Department of Boating and Waterways' *California Boating Accident Report For 1994* is a comprehensive study of boating accidents in the state.

California has some of the most accessible, diverse waterways in the nation. One of the primary missions of the Department is to protect the public's right to safe and enjoyable boating. To accomplish this, the Department administers a variety of boating safety, education, and law enforcement programs for the benefit of California's boaters.

Through the successful efforts of the Department, local law enforcement agencies, and boating organizations, California's safety record has improved. Although we should be proud of this, even one fatality is one too many. The Department will continue to provide education to boaters, targeting specific problem areas of concern. It is a priority of the Department to provide boating and aquatic education to our youth. By targeting our young people at an early age, we are giving them safety skills that they will use throughout their lives.

The California Boating Accident Report For 1994 provides information, analysis and recommendations based on boating accidents that occurred in the 1994 calendar year. Accident trends from previous years have also been used to identify critical problem areas. The Department has compiled this report with the hope of reducing the number of boating accidents and fatalities that occur on California's waterways.

For more information about this report or other accident statistics, please contact Amy Rigby at (916) 322-1824.

Sincerely,

A handwritten signature in black ink that reads "John R. Bañuelos". The signature is stylized with a large loop at the beginning and a long tail.

John Bañuelos
Director

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EXECUTIVE SUMMARY

The Department of Boating and Waterways has compiled this report with the hope of reducing the number of boating accidents and fatalities that occur on California's waterways.

Under existing law, boat operators who are involved in accidents are required to submit written accident reports to the Department under specified conditions. These reports are used to analyze boating accident trends and to identify areas of concern so that Department activities can be directed to promote boating safety, education and law enforcement in those areas.

The *California Boating Accident Report for 1994* provides information, analysis and recommendations based on boating accidents that have occurred in the 1994 calendar year. Accident trends from previous years have also been used to identify critical problem areas.

Significant Findings and Recommendations

- In 1994, a total of 709 boating accidents involving 386 injuries, 40 fatalities, and \$1,740,300 in property damage was reported to the Department. All of these figures are lower than the 1993 data; the percentage of fatalities relative to the total number of accidents is the lowest seen since 1961. This decrease in accidents may be due in part to the fact that 1994 was a very dry year with minimal rainfall and snowpack. In addition, there were no whitewater fatalities reported to the Department, compared with the 12 fatalities experienced during 1993. (Please see Tables 1 and 2 on pages 8 and 10 for additional information.)

- The 1994 accident data pertaining to youth operators shows that the number of fatal accidents they were involved in has decreased, but the total number of youth operators, the number of accidents involving them, and the number of injuries resulting from these accidents have increased. In 1994, 99 youth operators were involved in 86 accidents that resulted in 63 injuries and 3 fatalities.

Recommendation: Based on the 1994 accident data, accidents involving youth operators should continue to be monitored. At the present time, there is an ongoing national discussion about mandatory education. The Department believes that at the present time we

can address this issue through voluntary education in our public schools and in conjunction with organizations such as the United States Coast Guard Auxiliary and the United States Power Squadrons. Boating safety and education materials should be made available to youth operators with special emphasis placed on the rules of the road and the operation of personal watercraft (PWC). These materials will be incorporated into the "AquaSMART" program currently offered to elementary school students and the "Boating Safely" program offered to high school students by the Department.

- Although the total number of boating accidents declined in 1994, the number of personal watercraft accidents exceeded 1993 totals. In 1994, PWC accidents made up 36% of all reported accidents, 46% of injuries, 17.5% of fatalities, and 17% of the property damage. PWC were involved in 257 accidents resulting in 178 injuries, 7 fatalities, and \$294,800 of property damage.

Recommendation: Since the number of PWC accidents continues to escalate, special emphasis should continue to be placed on educating the operators of these craft. At the present time, the Department is conducting a boating use survey. This survey will measure the number of hours that vessels are used and will provide information that can be used for future recommendations.

- Vessel operation usually considered to be reckless and negligent was involved in 25% of PWC accidents. Sixty-four PWC accidents occurred when operators were maneuvering in repeated 360 degree turns, purposely wetting down other vessels, or wake jumping.

Recommendation: Many serious personal watercraft accidents resulted from these activities. This trend should be monitored and consideration of laws and regulations that prohibit these activities is strongly advised.

- In 1994, 24 of the 32 victims who drowned in California boating accidents were not wearing life jackets although 10 victims were riding in vessels that were equipped with life jackets. Victims not wearing life jackets included non-swimmers, people boating in rough weather, and victims boating alone or in small vessels.

Recommendation: Because of the variety of situations that can occur on the water, due to both environmental conditions and human error, the Department recommends that all boaters wear life jackets during boating activities. The Department plans to update the safety information it provides to the public. Further monitoring by the Department regarding life jackets will determine if more extensive laws are needed regarding the mandatory wearing of them in certain situations, such as on small, low profile vessels.

- Twenty-three percent of all motorboat fatalities occurring between January 1, 1993 and December 31, 1994 were alcohol related. This percentage shows a sharp decrease from a two-year study released in 1986 in which the percentage of alcohol-related motorboat fatalities equalled 59%. This decrease is due in part to the passage of more stringent laws concerning boating and alcohol since 1986 and public education about the dangers of operating a vessel while intoxicated.

Recommendation: The total number of alcohol-related fatalities has decreased dramatically. However, law enforcement and educational efforts in this area should be continued at a high level to further reduce boating fatalities caused by alcohol consumption. The Department will provide education in the form of public safety announcements and safety pamphlets, as well as continue to pursue legislative changes concerning Section 655.6 of the Harbors and Navigation Code regarding alcohol and minor operators. (For more information concerning this code section, please see page 28, "Minor Operators and Alcohol Consumption.") Also, the Department plans to analyze the effectiveness of laws pertaining to boating and alcohol in California.

- While the number of accidents involving water-skiing activities overall has decreased, the variety of these accidents and the severity of the injuries have increased. Accidents involving inner tubes and towing lines have seen the most dramatic increases.

Recommendation: Over the last several years, the sport of water-skiing has evolved into a multitude of activities. Because these activities require different safety measures, the Department will update the water-skiing safety information currently offered to the public in the "Safety Hints for Water-Skiing" pamphlet and will include information on inner tubing activities and safety precautions regarding ski lines.

- The number of accidents involving propeller cuts has risen from 4 in 1991 to 28 in 1994. Disregarding passenger safety and lack of knowledge regarding boat propellers on the part of vessel operators contributed to a large number of these accidents.

Recommendation: Since accidents involving boat propellers are increasing, the Department needs to better educate boaters on safety measures concerning them. The Department will include safety information in the "ABCs of California Boating" that is included with the vessel registration as well as the "Safety Hints for Water-Skiing" pamphlet.

INTRODUCTION

California's rivers, lakes, bays and coastal areas offer boating enthusiasts a wide variety of water recreational opportunities, including 1,356,780 surface acres of water, 30 popular whitewater rivers with approximately 2,600 miles of waterways, and 3,427 miles of coastline and tidal shoreline.

Because of the popularity of boating in California, the variety of waterways, and the growth of California's population, the number of vessels registered in the state has increased from 421,000 in 1970 to 841,311 in 1994. During the same time period, the number of boats per thousand persons increased from 20.7 to approximately 26.2.

The California Department of Boating and Waterways, the state's boating agency, administers statewide boating safety, education and law enforcement programs and also provides loans and grants for the construction of small craft harbors and boat launching facilities.

California's boating accident program is required by an agreement between the U.S. Coast Guard and the Department of Boating and Waterways. Accident information collected by the Department is forwarded to the U.S. Coast Guard in Washington, D.C., and is made a part of the Coast Guard's annual publication, *Boating Statistics*. California accident statistics are compiled under state law, Section 656 of the Harbors and Navigation Code, which requires a boater who is involved in an accident to file a written accident report with the Department if:

- a person dies, disappears, or is injured requiring medical attention beyond first aid;
- damage to a vessel or other property exceeds \$500, or there is complete loss of a vessel.

The purpose of this program is to provide a data base for accident analysis, which is then used as a tool for identifying areas of concern so that the Department's activities can be directed to promote boating safety, education and law enforcement in those areas. Information contained in the reports is confidential and may not be used in prosecuting any violation which may have occurred, nor in any civil litigation. The details of each reported accident are analyzed to determine the cause, how the accident might have been prevented, and other specific safety-related problems.

The *California Boating Accident Report for 1994* does not include information on all boating accidents that occurred in California in 1994. The Coast Guard and the American Red Cross have estimated that only 10-15% of the accidents that occur are reported to state programs due to ignorance of the reporting law or difficulty enforcing that law. The reporting of nonfatal and nonserious injury accidents is especially low. However, we believe that the vast majority of fatal and serious injury boating accidents in California are reported to the Department.

Based on accident trends in the past, the Department has made recommendations to the Legislature for changes in California boating law and has developed safety and education campaigns for such activities as water-skiing, personal watercraft operation, hunting and fishing from boats, and boating and alcohol consumption. Accident report analysis has also contributed to the development of a whitewater boating course, conducted by the American Red Cross, a Kindergarten through 12th grade education program developed by the Department in conjunction with the California Department of Education, and other boating safety education courses offered through schools and universities.

BOATING ACCIDENTS - GENERAL PERSPECTIVE

In 1994, a total of 709 accidents involving 386 injuries, 40 fatalities and \$1,740,300 in property damage was reported to the Department. All of these numbers are lower than the 1993 totals, which were 743 total accidents, 434 injuries, 67 fatalities and \$2,052,800 in property damage. Please see Tables 1 and 2 for additional information.

General Findings from 1994

1. "Operator inattention" was the primary cause of boating accidents.
2. Approximately 45% of all boating accidents involved a collision with another vessel.
3. Most boating accidents occurred in the summer months. The greatest number of accidents occurred in July.
4. The majority of accidents occurred on Saturday and Sunday.
5. The greatest number of boating fatalities occurred on Monday.
6. The greatest number of boating accidents occurred from 2:01 p.m. to 4:00 p.m.
7. Approximately 76% of vessels involved in accidents were less than 26 feet in length.
8. Of the victims who drowned in boating accidents, 75% were not wearing life jackets.
9. Operators from the 35-49 age group were involved in more accidents than any other age group, followed by the 25-34 age group.
10. Single vessel accidents accounted for 100% of alcohol-related fatalities.
11. Out of 194 personal watercraft (PWC) accidents involving collisions, 126 (65%) involved a PWC colliding with a second PWC.
12. Nine percent of all vessels involved in accidents were known to be rented. Eighteen percent of all PWC involved in accidents were known to be rented.

TABLE 1
1994 BOATING ACCIDENTS BY COUNTY

<u>COUNTY</u>	<u>NUMBER OF ACCIDENTS</u>	<u>INJURIES</u>	<u>DEATHS</u>	<u>PROPERTY DAMAGE</u>
Alameda	10	2	1	\$ 35,700
Amador	3	1	0	1,800
Butte	4	0	0	18,100
Calaveras	12	9	1	5,200
Colusa	6	6	0	0
Contra Costa	40	21	0	111,200
El Dorado	7	4	0	5,200
Fresno	13	3	1	29,600
Glenn	1	0	0	2,000
Humboldt	4	4	3	5,300
Imperial	12	5	0	20,500
Kern	24	17	1	13,600
Kings	1	0	0	1,000
Lake	10	8	0	4,100
Lassen	1	0	0	600
Los Angeles	62	23	4	233,500
Madera	12	7	1	5,200
Marin	10	3	4	26,200
Mariposa	1	0	0	3,000
Mendocino	4	2	0	3,200
Merced	4	0	0	2,600
Monterey	8	3	1	5,700
Napa	17	14	1	45,300
Nevada	1	1	0	0
Orange	6	2	0	20,000
Placer	15	8	0	33,100
Plumas	6	3	0	10,100
Riverside	72	47	2	69,500
Sacramento	20	11	0	133,300
San Bernardino	69	53	4	118,400
San Diego	54	21	0	131,600
San Francisco	6	2	0	64,300
San Joaquin	31	20	1	143,600
San Luis Obispo	14	5	5 ¹	19,100
San Mateo	4	3	0	80,500
Santa Barbara	7	3	0	20,200
Santa Clara	15	8	2	23,600
Santa Cruz	2	1	1	7,000
Shasta	25	10	2	60,400
Siskiyou	1	0	0	12,000
Solano	5	3	1	8,700
Sonoma	13	5	3	30,400
Stanislaus	19	14	0	11,900
Sutter	6	5	0	2,000

Table 1 Continued

<u>COUNTY</u>	<u>NUMBER OF ACCIDENTS</u>	<u>INJURIES</u>	<u>DEATHS</u>	<u>PROPERTY DAMAGE</u>
Tehama	1	0	0	700
Trinity	11	10	0	6,500
Tulare	17	10	0	21,600
Tuolumne	9	3	0	19,000
Ventura	9	3	0	111,200
Yolo	1	0	0	3,000
Yuba	4	3	1	0
TOTALS	709	386	40	\$ 1,740,300

¹ For the second consecutive year, San Luis Obispo County experienced the greatest number of boating fatalities. One accident involved a triple fatality in the ocean, when a vessel sunk. One accident occurred on an inland lake when a PWC operator fell overboard. The other fatality occurred when a small motorboat capsized in the surf. The number of fatalities is not nearly as high as the 1993 figure for this county in which 10 people died.

TABLE 2
BOATING ACCIDENTS IN CALIFORNIA
1980-1994

Year	Total Number of Accidents	Total Number of Injuries	Total Number of Deaths	Total Amount of Property Damage
1980	657	270	112	\$2,039,800
1981	728	319	87	\$3,655,630
1982	696	323	103	\$2,497,000
1983	648	333	95	\$3,713,100
1984	791	341	93	\$2,491,700
1985	869	403	76	\$4,246,400
1986	741	319	68	\$2,645,500
1987	905	325	54	\$3,381,600
1988	745	333	51	\$2,396,100
1989	632	371	43	\$3,669,800
1990	761	416	50	\$3,131,200
1991	750	421	58	\$2,653,800
1992	689	447	59	\$4,360,100
1993	743	434	67	\$2,052,800
1994	709	386	40	\$1,740,300

ACCIDENTS INVOLVING YOUTH OPERATORS

Background

California law requires a person to be at least 12 years of age to operate a motorboat with more than 10 horsepower, unless there is a person 18 years of age or older on board the vessel. This law went into effect in 1987.

In the *California Boating Accident Report For 1993*, the Department reported that 77 youth operators were involved in 67 accidents, resulting in 51 injuries and 7 fatalities.

Representative Accidents

The following cases are representative of accidents involving youths occurring in 1994. For purposes of this review, youths are considered to be under 18 years of age.

- A 13-year-old female PWC operator tried to spray the occupants of a second PWC, but collided with their vessel instead. The operator of the second vessel had to have her spleen and pancreas removed. A passenger aboard the vessel sustained assorted lacerations.
- Two 13-year-old female PWC operators were jumping each other's wakes and collided. One of the operators sustained a head injury requiring stitches and a neck injury.
- A 16-year-old male PWC operator and a 17-year-old male PWC operator collided when one of them failed to give way in a crossing situation. One operator sustained a head injury and the loss of several teeth.
- Two 15-year-old female PWC operators collided in a head-on situation, due to restricted visibility and ignorance of the rules of the road. A passenger aboard one of the vessels sustained a broken leg.

- A 16-year-old female was operating an open motorboat when she collided with a kayak. She did not see the other vessel until she was upon it. One of the people aboard the kayak sustained lacerations to his legs.

Findings

The 1994 accident data pertaining to youth operators shows that the number of fatal accidents they were involved in has decreased, but the total number of youth operators, the number of accidents involving them, and the number of injuries resulting from these accidents have increased. (For 1993 totals, please see the section titled "Background" on the previous page.)

In 1994, 99 youth operators under the age of 18 were involved in 12% of all boating accidents, 16% of injuries, and 7.5% of fatalities. A total of 86 accidents, 63 injuries and 3 fatalities were reported.

Of the 99 youth operators, 56 were under the age of 16. Thirty of these accidents involved operators who were under the age of 14. These figures have increased from last year's totals.

Other Significant Findings

- Eighty-five percent of all youth operators involved in accidents were riding PWC.
- Collisions with other vessels occurred in 78% of all accidents involving youth operators.
- Operator inexperience and operator inattention were the primary causes of accidents involving youth operators. Violations of the rules of the road and excessive speed were common secondary causes.

Recommendations

Based on the 1994 accident data, accidents involving youth should continue to be monitored. At the present time, there is an ongoing national discussion about mandatory education. This Department believes that at the present time we can address this issue through voluntary education in our public schools. Boating safety and education materials will be available to youth operators with special emphasis placed on the rules of the road and the operation of PWC. This material will be incorporated into the "AquaSMART" program

currently offered to elementary school students and the "Boating Safely" program offered to high school students by the Department.

The following table contains supplementary information regarding youth operators.

**TABLE 3
ACCIDENTS INVOLVING YOUTH OPERATORS**

Age	Number of Youth Operators Involved in Accidents	Number of Injuries Where Youth Operators of This Age Group Were Involved	Number of Deaths Where Youth Operators of This Age Group Were Involved
2*	1	0	0
7	1	1	0
10	1	0	0
11	1	1	0
12	12	9	0
13	14	11	1
14	11	8	1
15	15	9	1
16	25	17	0
17	18	12	0
TOTALS	99	68**	3

* This accident involved a 2-year-old male who was sitting aboard a PWC. His father was standing in the water next to the vessel. The child grabbed the throttle, gave the engine full power and sped across the water, crashing into a dock. The child was uninjured.

** Five injuries were double counted because both the operators involved in each of these accidents were minors in different age groups. The total number of injuries involving all minor operators was 63.

PERSONAL WATERCRAFT ACCIDENTS

Background

A personal watercraft (PWC) is a small vessel that uses an internal combustion engine powering a jet pump or a propeller. It is designed to carry from one to three persons, and to be operated by a person sitting, standing, or kneeling on the vessel rather than the conventional manner of sitting or standing inside the vessel.

The use of personal watercraft is subject to all state, local and federal regulations governing the operation of powerboats of similar size.

California law states that it is an infraction for a person under 12 years of age to operate a motorboat designed to carry only one person. In addition, any person who permits a person under the age of 12 to do so is guilty of an infraction. A person under 12 may operate a motorboat designed to carry at least two persons if accompanied by a person 18 years or older.

As of December 31, 1994, there were approximately 110,255 personal watercraft registered in California.

Representative Accidents

The following cases are representative of PWC accidents that occurred in 1994.

- A PWC collided head-on with a pontoon boat on a lake. It was the operator's first time on a PWC by himself. He died from severe internal injuries.
- A PWC operator was making 360 degree turns and failed to see another operator on a PWC and collided with him. The second operator sustained broken bones in his foot and 14 stitches in his leg.
- A mother and son were operating PWC, one behind the other. She was following too closely and collided with him when he stopped suddenly. She

sustained bruised ribs and he fractured two vertebrae.

- A PWC operator attempted to jump the wake of a boat pulling a person on a tube. The tuber dropped the rope to avoid a collision and the PWC collided with the boat instead. The PWC operator sustained a neck injury and his passenger sustained multiple lacerations.
- A PWC operator was wake jumping and became separated from his craft in the air, causing him to fall on top of it and break his leg.
- A motorboat had its bow up, limiting the vision of the operator, who ran over a PWC. The PWC operator was able to abandon his craft before the collision, but his vessel was destroyed.

Findings

During the 1994 boating season 257 PWC accidents were reported to the Department which resulted in 178 injuries, 7 fatalities, and \$294,800 in property damage.

The number of PWC accidents experienced is higher than expected considering their registered numbers. Department of Motor Vehicles information indicates that personal watercraft account for 13.1% of all vessels registered in California. Department of Boating and Waterways statistics reveal that personal watercraft were involved in 36% of all the accidents, 46% of the injuries, 17.5% of the fatalities, and 17% of the property damage.

Injury Accidents

Injuries resulting from PWC accidents account for nearly half of the total injuries experienced in all boating accidents. The fact that PWC operators and passengers are in an exposed position, sitting on the craft rather than in the craft contributes to these injuries. Broken bones, head injuries, and lacerations are the most common types of injuries experienced.

Fatal Accidents

The number of PWC-related fatalities is slightly higher than expected based on the registration numbers. The 7 fatalities experienced in 1994 is the highest number recorded since the Department began tracking PWC accidents in 1989. (See Table 4 below.) Several PWC operators were injured severely, but were kept afloat by their life jackets until help arrived. The voluntary use of life jackets by PWC operators and passengers helps prevent more fatalities from occurring.

TABLE 4
TOTALS FOR PERSONAL WATERCRAFT ACCIDENTS IN CALIFORNIA
1989-1994

Year	Total Number of Reported PWC Accidents	Number of PWC Related Injuries	Number of PWC Related Fatalities	Amount of PWC Related Property Damage
1989	105	83	1	\$73,300
1990	167	115	2	\$159,400
1991	181	116	5	\$169,300
1992	167	118	2	\$128,000
1993	248	178	5	\$306,900
1994	257	178	7	\$294,800

Type of Accidents

Collisions with other vessels made up the majority of accidents involving PWC. In 1994, 194 accidents (75%) were the result of PWC colliding with other vessels. Of those occurrences, 126 involved a PWC striking a second PWC. Accidents involving PWC operators who became separated from their craft and then fell back on top of it resulted in 16 accidents (6%) and falls overboard resulted in 17 accidents (6%). Nine accidents (3%) involved people being struck by boats. These accidents happened when either PWC operators struck water-skiers or when PWC operators became separated from their craft and were hit by other boaters.

Operation at the time of accident

Common maneuvering activities preceding accidents included wake jumping, repeated 360 degree turns ("doughnuts"), and purposely wetting down other vessels. These types of activities represented 25% of all PWC accidents and were most often attempted by operators who were very inexperienced. Wake jumping alone accounted for 13% of all boating accidents. This percentage increased from the 1993 accident data which revealed that 10% of all accidents were caused by wake jumping. Several accidents occurred when PWC operators struck water skiers while attempting to jump the wake of the boat pulling them.

In the majority of the aforementioned accidents, these boating activities were classified as reckless and negligent vessel operation, since it is difficult for PWC operators to maintain a proper lookout while engaging in these activities.

Accident Causes

Operator inattention, operator inexperience, excessive speed, and violations of the rules of the road figured either as primary or secondary causes in the majority of PWC accidents.

Operator inattention, the most prevalent cause, was a factor in 60% of all PWC accidents. The second greatest cause of PWC accidents was operator inexperience, which was a factor in 41% of these accidents. (Please see the table on page 51 of this report titled "Causes of Boating Accidents-Personal Watercraft" for further information regarding PWC accident causes.)

Age of Operator

A common misconception about PWC accidents is that the majority of them involve minor operators. This is not the case. The 1994 statistics revealed that the majority of PWC operators involved in boating accidents fell into the age group of 25-34 and the average age of a PWC operator who was involved in an accident was 26. However, accidents involving youth operators are increasing and should be taken very seriously. (Please see the table titled "Age of Operator-Personal Watercraft" on page 49 for further information regarding PWC operator age.)

Lack of Visibility

Personal watercraft sometimes present a danger to their riders because of the craft's lack of visibility once it has fallen over. Several accidents occur each year because riders who are attempting to remount their PWC are not visible to other watercraft and collisions ensue.

Rental PWC

Of the 390 PWC involved in the 257 accidents, 18% were rented. A much more common scenario involves inexperienced PWC operators borrowing the vessels and having accidents. Operator inexperience was a factor in 41% of all PWC accidents.

Boating Use Survey

At the present time, the Department is conducting a boating use survey. Among other things, this survey will measure the number of hours that vessels are used. It might be argued that personal watercraft are used more than other vessels, which would then account for the higher than expected number of PWC accidents. However, use information is not available at the time of this report, but should be available for the 1995 boating accident report.

Recommendations

The number of PWC accidents and the percentage of these accidents in relation to all boating accidents have increased substantially over the last six years. Therefore, the Department continues to urge boating safety education for operators of these craft.

Accidents involving wake jumping, doughnuts, and wetting down other vessels accounted for a large number of PWC accidents. The majority of these accidents were caused by reckless and negligent vessel operation. This trend should be monitored and consideration of laws or regulations that specifically target wake jumping and other radical maneuvers is strongly advised.

PERSONAL FLOTATION DEVICES

Background

Personal flotation devices (PFDs), are more commonly referred to as life jackets. PFDs are manufactured in adult, child, and infant sizes, according to weight.

California boating law, in compliance with federal regulations, states that recreational vessels operating on waterways of this state must be equipped with the proper number and size of personal flotation devices for the people on board.

On January 1, 1994, a state law went into effect regarding children and the wearing of life jackets. Section 658.3 states the following:

No person shall operate a motorboat, sailboat, or vessel that is 26 feet or less in length unless every person who is six years of age or less is wearing a type I, II, III Coast Guard approved personal flotation device while that motorboat, sailboat, or vessel is underway.¹

Representative Accidents

The following cases are representative of accidents involving drowning victims who were not wearing life jackets.

- A victim was boating alone. Witnesses aboard a second vessel said he bent down to get something while operating the vessel and when they next looked, he was in the water. They saw a hat and coat afloat and approached the area, but the victim disappeared before they could reach him.
- A victim was boating alone and fell overboard for unknown reasons. His body was recovered later that day. It was known that the victim could not swim, but never wore his life jacket. The life jacket was found on the seat back when the boat was recovered.

¹ This law does not apply to a person operating a sailboat on which a person who is six years of age or less is restrained by a harness tethered to the vessel, or to a person operating a vessel on which a person who is six years of age or less is in an enclosed cabin. Also, this law does not apply to an operator reacting to an emergency rescue situation.

- A PWC collided with a rock wall and the operator fractured his skull. Help was nearby, but he disappeared below the surface of the water before help could reach him. The operator was not wearing a life jacket.
- The operator of a vessel jumped overboard without a life jacket to save a second individual who was wearing a life jacket. The wind blew the vessel away from the people in the water and the person remaining in the vessel was frantic because she did not know how to operate it. She watched helplessly as the operator drowned before help arrived. (The person in the life jacket survived.)
- A person fell overboard from a houseboat and a second person jumped in to save him. Neither was wearing a life jacket. The others on board could not find the throwable flotation device because it was being used as a bumper between the houseboat and a second vessel, which was being towed. The vessel operator was also inexperienced and had trouble maneuvering the vessel. Both individuals drowned.
- A rogue wave capsized a sailing vessel, washing the victim into the water. He was an experienced sailor and had removed his life jacket temporarily for comfort. The ocean had been calm and the wave took him by surprise.
- Two people were canoeing on a lake when passenger movement caused the vessel to capsize. The victim was a swimmer, but was wearing a layer of thermal clothing under his other clothes plus hiking boots and heavy socks. He was unable to make it to shore.

Findings and Recommendations

Of the 40 people who died in boating accidents in 1994, the **primary** cause of death in **32** instances was drowning. Of these victims, **75%** were not wearing life jackets. Life jacket usage could have made a critical difference in these cases.

TABLE 5, PFD USAGE

Fatalities	Number
Victims who were wearing life jackets	3
Victims who were wearing life jackets, but not properly, of the proper size, or the life jacket had come off	5
Victims who were not wearing life jackets	24

On closer examination of the accidents involving the 24 people who were not wearing life jackets, the largest group of incidents involved victims who drowned even though the vessels they were riding in were properly equipped with life jackets.

TABLE 6, VESSELS EQUIPPED WITH PFDs

Fatalities	Number
Victims aboard vessels that were carrying the proper number of life jackets	10
Victims aboard vessels that were not carrying any life jackets.	5
Victims aboard vessels where it is unknown if they were carrying all the proper life jackets, but had some Type IV (throwables)	2
Victims aboard vessels where life jacket carriage information is unknown	7

The 1994 accident data has shown the following situations, and often a combination of these situations, to be major reasons why boaters drowned while not wearing PFDs. Many of them were separated from their vessels without warning and disappeared beneath the

surface of the water within seconds.

Boating Alone

Boating alone was a contributing factor in 8 fatalities. Victims found themselves in circumstances that they could not handle alone and drowned. Having another person aboard the vessel could have saved their lives.

Lack of Swimming Ability

Common sense would seem to be a good reason for non-swimmers to wear life jackets while boating. Unfortunately, lack of swimming ability played a major role in 5 fatalities when victims did not wear life jackets that were readily available to them in the vessels they were riding in.

Alcohol Use

The use of alcohol significantly affects the reaction time of victims in an aquatic environment. The combination of alcohol and lack of a PFD contributed to 2 fatalities in 1994.

Injury or Poor Health

This year, 2 victims were injured severely in boating accidents and died **not** because their injuries were life threatening **but** because they drowned when they lost consciousness or lacked the strength to keep themselves afloat until help arrived. Also, poor health, which quickly incapacitates even a person who can swim, contributed to 4 fatalities.

Lack of Knowledge or Preparedness on the Part of Others in the Vessel

The failure of an operator to adequately train at least one passenger of a vessel in its operation contributed to one fatality in 1994. Also, two other victims drowned because people aboard a vessel were not familiar with the location of the safety equipment and when located, it was not readily accessible. Operators and passengers alike may have to depend on the others in the vessel to save their lives.

Rough Weather and Water Conditions

Inclement weather and rough, cold water conditions contributed to 3 falls overboard and 6 capsized vessels that subsequently resulted in drownings. Many of these accidents occurred on coastal waters where environmental conditions change rapidly. Several victims in vessels were surprised by rogue waves and had no time to prepare for disaster. Other victims were paralyzed by the freezing water.

Small or Low Profile Vessels

Small, low profile vessels contributed to 6 fatalities. These vessels are much more likely to flood or capsize quickly and deposit passengers into the water without warning.

Heavy Clothing

Heavy clothing contributed to two drowning fatalities. In both cases, the victims could swim. Even though clothes can protect people from hypothermia², they can also pull them below the surface of the water. Heavy cowboy and hiking boots which filled with water were significant factors in the drownings. If cold weather conditions dictate the wearing of warm clothes, the buoyancy of a life jacket can counteract the weight of the clothes.

Recommendations

Because of the variety of situations that can occur on the water, due both to environmental conditions and human error, the Department recommends that all boaters wear life jackets during boating activities. The Department plans to update safety information that is provided to the public.

Further monitoring of life jacket use by the Department will determine if more extensive laws are needed regarding the mandatory wearing of life jackets in certain situations, such as on small, low profile vessels or when boating alone.

² Hypothermia is a condition in which the body loses heat faster than it can produce it, causing a dangerous reduction in body temperature. Death can result if the body's temperature drops too low.

ALCOHOL USE IN FATAL BOATING ACCIDENTS

Obstacles to Accuracy

The issue of accurate reporting and analysis in boating accidents where alcohol is a factor has been a problem for a variety of reasons, as described below:

Relying on Witness Accounts

Sometimes fatal accidents are reported without boating law enforcement officers being involved at the accident site. Reporting the accident may be delayed for 12 hours or more because persons involved want to wait until the next morning to report an accident or they are too distraught to notify authorities. In alcohol-related accidents, this delay can alter circumstances dramatically, due to alcohol burn-off, and the fact that operators are unlikely to report themselves as having been under the influence of alcohol at the time of the accident. Also, in some cases where victims are seriously injured, transporting them to treatment takes priority over blood alcohol testing, and alcohol information is lost.

Delayed Recovery

Delayed recovery is the largest obstacle to collecting reliable data on blood alcohol levels. It is often the case that the bodies of boating accident victims are not recovered or are recovered months later when the effects of putrefaction¹ renders blood analysis invalid. Compounding the problem, several law enforcement agencies have reduced their on-the-water boating law enforcement patrols due to funding problems. Fewer enforcement personnel can reduce the ability of the Department to collect accurate accident information. Authorities indicate that when there is a delay in the recovery of a body of more than two days, serious doubt develops as to the accuracy of any blood alcohol levels. Witness accounts and officers' reports, in addition to blood alcohol levels, can be used to document alcohol impairment in some cases.

¹ Putrefaction is the decomposition of organic matter. Due to bacterial action and oxidation, a body may produce its own alcohol during this process, which then results in a false reading for alcohol use.

Results of Previous Alcohol Studies

1986 Alcohol Study

In January of 1986, the Department submitted a study to the California Legislature, *Boating Safety Report*, of alcohol-related motorboat accidents that occurred between November 1, 1983 and October 31, 1985. A significant finding of that report was that 59% of all motorboat fatalities were alcohol related, where testing could be conducted. Since the release of the 1986 report, new laws regarding boating under the influence have been passed. For example, in 1987, it became illegal to have a blood alcohol level of .10% or above while operating a vessel. In 1991, this level was lowered to .08%. Furthermore, a "boating under the influence" conviction now appears on Department of Motor Vehicles records and can be used to suspend or revoke a vehicular driver's license. Beginning in 1987, the Department of Boating and Waterways began to provide specialized alcohol enforcement training for on-the-water peace officers. The Department stresses the importance of avoiding alcohol while boating in a variety of public education programs, posters, pamphlets and public service announcements.

1993-1994 Alcohol Study-Preliminary Findings

The Department conducted a new two-year study between January 1, 1993 and December 31, 1994 regarding boating and alcohol use. The first year's findings were presented in the *California Boating Accident Report For 1993*, and revealed that 33% of all motorboat fatalities were alcohol-related where testing could be conducted. This figure, although preliminary, was a substantial reduction from the 59% found in the 1986 study, and was highly encouraging. The final results of this two-year study are presented in this report. The Department plans to closely monitor alcohol use on the water on a yearly basis in order to keep abreast of trends.

Study Parameters for 1994 Alcohol Data

In this study, a blood alcohol level of .035% was used to determine whether or not a person was "under the influence." The National Transportation Safety Board has determined that when the concentration of alcohol in the bloodstream reaches this level, noticeable changes in a person's competence occur. The *California Boating Accident Report for 1994* analyzes only fatal alcohol-related boating accidents. A total of 31 fatalities were used to

calculate the number of accidents where alcohol was involved. This number is smaller than the total number of fatalities due to the inability to determine alcohol use/nonuse of boaters in all cases for the reasons noted earlier. A significant number of fatalities did not allow for sufficient analysis and had to be eliminated from the study. Previously, Department staff consulted at length with representatives of Sacramento County's Crime Laboratory in order to assure the most fair and accurate analysis of cases where there was delay of recovery.

Representative Accidents

The following are descriptions of the fatal alcohol-related accidents that occurred in 1994.

- A 27-year-old male PWC operator was operating his craft at night without lights and collided with a canyon wall at a high rate of speed. He sustained a fractured skull and drowned because he was not wearing a life jacket and couldn't stay afloat due to his injuries. His blood alcohol level was .08%.
- A 28-year-old male PWC operator was maneuvering his rented PWC in a circle when he fell overboard and drowned. The victim could not swim and was not wearing a life jacket. The victim's blood alcohol level was .12%.
- Three fallen wake board operators were being picked up by the vessel pulling them. The victim, a 19-year-old male, became tangled in the ski line which got caught in the propeller, pulling the victim into it. The victim's blood alcohol was .05%.

Findings

Table 7 shows the categorical breakdown of the 31 fatalities used in the study for 1994.

**TABLE 7
ALCOHOL-RELATED FATALITIES 1994**

FATALITIES				
Boat Type	Total	Total Sober	Total Under Influence	Percentage Under Influence
All Boats	31	28	3	9.6%
Motorboats Only	27	24	3	11.1%

Table 8 shows the combined totals for 1993 and 1994 of alcohol-related fatalities involving only motorboats.

**TABLE 8
ALCOHOL-RELATED FATALITIES INVOLVING MOTORBOATS 1993-1994**

FATALITIES				
Year	Total	Total Sober	Total Under Influence	Percentage Under Influence
1993	33	22	11	33.3%
1994	27	24	3	11.1%
1993 & 1994	60	46	14	23.3%

Accident Specifics

In every fatality, the victim and the person consuming the alcohol were the same individual. All of the victims were adult males. Single vessel accidents accounted for 100% of all alcohol-related boating fatalities in 1994. Two vessels were personal watercraft and one was an open motorboat.

Cause of Death

The cause of death for two of the three victims was drowning. Neither of the victims was wearing a life jacket. One victim fell overboard and although uninjured, did not know how to swim. The other sustained injuries, which although severe, were not life threatening. He was unable to keep himself afloat. Both of the victims were in situations where help could reach them in a short time, but drowned before help could reach them.

The third victim was killed in a water-skiing type accident. His ski line was wrapped around part of his body and the line became entangled in the boat propeller, pulling him into it. The victim's consumption of an alcoholic beverage was one of many components of this accident. Alcohol may have caused the victim to become careless with his handling of the ski rope or of his position relative to the vessel. Section 655 (b) of the Harbors and Navigation Code also makes it illegal to operate water skis or similar devices while under the influence of alcohol. (This accident is also mentioned in the "Water-Skiing Accidents" section of this report.)

Minor Operators and Alcohol Consumption

Currently, the Department is sponsoring AB 749 to amend Section 655.6 of the Harbors and Navigation Code. This section, in its present form, states the following:

It is an infraction for a person under the age of 18 years who has 0.05 percent or more, by weight, of alcohol in his or her blood to operate any motorized recreational vessel.

An alcohol level of .04% is a substantial amount for any person, let alone an individual less than 21 years of age. Since there are already state laws which outlaw the purchase or possession of an alcoholic beverage by a minor, there is no reason for a minor to have a blood alcohol level of .04%. The Department's proposed amended version of the law states:

It is an infraction for a person under the age of 21 years who has 0.01 percent or more, by weight, of alcohol in his or her blood to operate any motorized vessel.

This bill is very similar to an existing law in the Vehicle Code pertaining to minor operators of vehicles, which specifies the same blood alcohol limit.

Recommendations:

The total of alcohol-related fatalities has decreased dramatically. However, law enforcement and educational efforts in this area should be continued at a high level to further reduce boating fatalities caused by alcohol consumption. The Department will continue to provide education in the forms of public safety announcements and safety pamphlets. Additionally, the Department plans to analyze the effectiveness of boating and alcohol laws in California.

The Department is also pursuing changes to Section 655.6 of the Harbors and Navigation Code, which would make it illegal for persons operating vessels under 21 years of age to have a blood alcohol concentration exceeding .01%.

Drug Related Fatalities

There were 5 fatalities involving drugs reported in 1994: three cases involving the use of cocaine, one case involving methamphetamine, and one case involving marijuana. Unlike alcohol testing, drug testing has no established threshold levels at which a person is considered to be "under the influence." These drugs are illegal regardless of the amount of the drug present. However, whether or not the drug affected a person's competency level is not clear in many cases, especially since, unlike alcohol, some drugs stay in the blood stream for extended periods. These factors make the evaluation of drug-related accidents difficult and the analysis of these accidents is beyond the scope of this report.

WATER-SKIING ACCIDENTS

Background

For the purposes of this report, water-skiing activities include water-skiing as well as activities involving the towing of knee boards, wake boards, and inner tubes.

Unlike other types of water-skiing activities, people aboard inner tubes are not able to exert control over the direction of travel and their safety depends entirely upon the operator of the vessel towing them. Aside from this difference, there are a number of similarities between water-skiing and inner tubing and for that reason, the towing of an inner tube is classified as a sub-category of water skiing.

A wake board is a cross between a water ski and a surfboard. The wake board is larger than a water ski, but smaller than a surfboard. The user is towed at lower speeds on a shorter than normal water ski line. Wake-boarding is similar in concept to snow boarding, another emerging sport that is currently very popular.

California law states that:

No person shall operate a vessel on any waters for towing a person or persons on water skis, an aquaplane, or similar device unless there is in the vessel a person at least 12 years of age, in addition to the operator, in a position to observe the progress of the person being towed.

Representative Accidents

The following cases are representative of accidents occurring during water-skiing activities.

- A water-skier was in the water, ready to ski. As the vessel accelerated, the ski line wrapped around the skier's hand, amputating several fingers.

- A boat was pulling people on an inner tube. When they fell off, the tube flipped over and filled with water, creating increased drag and putting extensive tension on the tow line. The line came loose and snapped back, striking the observer in the head. The victim suffered a loss of vision in one eye and a large hematoma¹ on his forehead.

- A vessel was pulling an inner tube. The ski handle came loose from the ski pylon and snapped back, striking a person on board the vessel in the lower leg. The victim's leg was broken in three places, 56 stitches were required, and extensive nerve damage resulted.

- A person had just finished skiing and was sitting on the swim step of a vessel, pulling in the ski line. The ski flag was raised, as there was still a ski line in the water. A second vessel came very close to this vessel at a high rate of speed and ran over the ski rope which became caught in the propeller. The line then broke, and snapped back, striking the person on the swim step in the stomach and leg. She received third degree rope burns and a fractured pelvis.

- A PWC operator came around the stern (back) of a vessel to jump its wake and did not see the skier behind the vessel. He hit the ski rope, which jerked him off his vessel. The PWC operator suffered a severe injury to his mouth and was air lifted to the hospital.

- A vessel operator was towing a person on an inner tube around a blind curve at a considerable speed. The vessel operator reduced his speed to accommodate oncoming traffic, but the tuber continued forward and struck the levee. The tuber sustained neck and shoulder injuries.

¹ A hematoma is a tumorlike collection of blood, usually clotted, located outside a blood vessel.

Findings

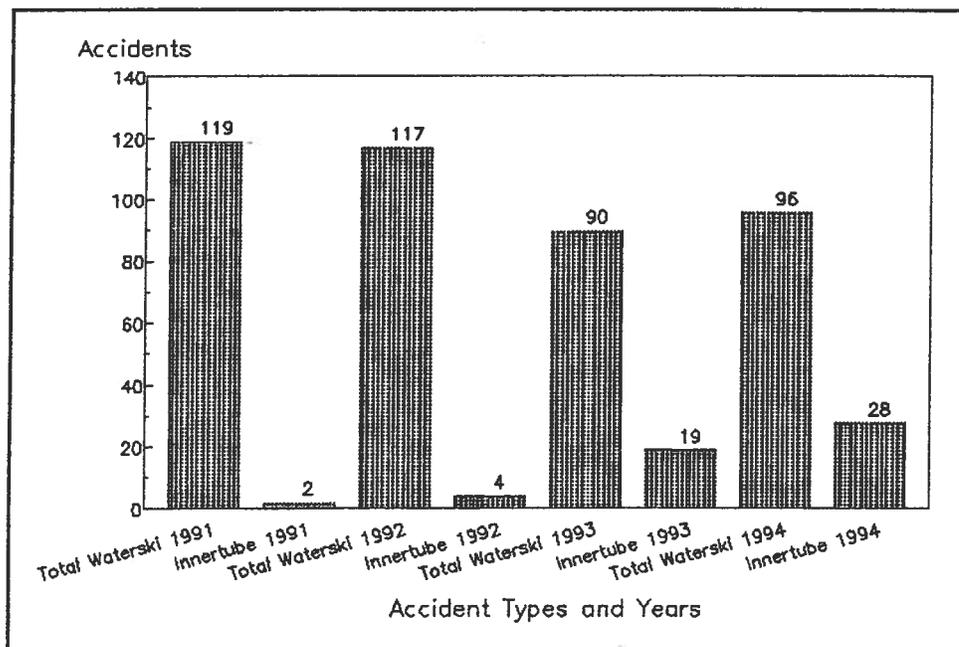
Over the last several years, the number of accidents involving water-skiing activities overall has decreased, but the variety of these accidents and the severity of the injuries have increased. Accidents involving inner tubes and towing lines have seen the largest increases.

Water-skiing activities accounted for 13% of all accidents, 21% of all injuries and 3% of all fatalities during the 1994 boating season. Ninety-six water-skiing accidents involving 84 injuries and 1 fatality were reported to the Department.

Accidents Involving Inner Tubes

Of the 96 water-skiing accidents, 28 involved the towing of inner tubes. Accidents involving inner tubes have increased substantially over the last four years. In 1991, they accounted for 1.6% of total water-skiing accidents; in 1994 they rose to 29%.

TABLE 9
INCREASE IN ACCIDENTS INVOLVING INNER TUBES



The most common cause of these accidents was inattention on the part of the vessel operator. Severe injuries resulted from the failure of operators to allow enough clearance for tubes around fixed objects or other vessels.

Also, several neck and back injuries were experienced by people on tubes when they were pulled through rough water at water-skiing speeds.

Towing Lines

Accidents involving towing lines resulted in a number of serious injuries and contributed to one fatality during the 1994 boating season. Although the numbers of these accidents have not increased as remarkably as accidents involving inner tubes, during the last two years, they have become a noticeable problem.

Several amputations occurred when ski lines became wrapped around body parts and then were pulled taut. Injuries were also caused when ski lines that were attached to inner tubes or held by skiers came loose and snapped back, injuring people on board the towing vessel.

A fatal accident also occurred involving wake-boarding activities. A vessel was engaged in retrieving three fallen wake-boarders. One of these people became caught in the towing line which became tangled in the propeller. The victim was pulled into the propeller before the engine could be shut off. He died from severe wounds.

Lines towing wake boards are usually shorter than normal ski lines. For this reason, operators need to take extra care when operating around these lines.

Based on the 1994 accident data, the Department recommends that the following precautions also be taken when operating with or around ski lines.

- Lines used to tow inner tubes should be securely fastened before the vessel begins towing the tube.

- The ski flag should remain in a raised position until all people and equipment, including ski lines, are completely out of the water.
- When water-skiing activities end, the vessel engine should never be engaged until the ski line is completely inside the vessel to avoid injuries or the rope catching in the propeller.
- Water skiers should never allow ski lines to wrap around themselves. This rule also applies to persons engaged in letting rope out to skiers.
- Ski lines should always be the same length when two skiers are being pulled by a vessel.
- Boaters should carefully check to see if other boats are towing water-skiers or tubers before proceeding near them.

Recommendations

Over the last several years, the sport of water-skiing has evolved into a multitude of activities. Because these activities require different safety measures, the Department will update the water-skiing safety information currently offered to the public in the "Safety Hints for Water-Skiing" pamphlet and will include information about inner tubing activities and safety precautions regarding ski lines. These pamphlets will also be distributed where water-skiing activities are popular.

ACCIDENTS INVOLVING BOAT PROPELLERS

Background

Accidents involving vessel propellers are often thought to be primarily associated with water-skiing activities, however, they often occur in other situations as well.

Bow-riding activities can conclude in injuries from a boat propeller. Bow riding is a violation of Section 655 (a) of the Harbors and Navigation Code. This activity is defined in 6697 of Title 14 of the California Code of Regulations as:

Riding on the bow, gunwale or transom of a vessel propelled by machinery underway when such position is not protected by railing or other reasonable deterrent to falling overboard, or riding in a position or manner which is obviously dangerous.

Representative Accidents

- A motorboat operator was operating at cruising speed. The vessel hit an obstruction underneath the surface of the water. A second individual, who was bow riding, fell overboard and was run over as the boat continued to move forward. The victim suffered 3 broken ribs, open chest wounds and lacerations down his back.
- A houseboat operator had a large number of individuals on board his boat and did not have good visibility in the rear of the vessel. He backed up to leave the shoreline and ran over two people who were swimming in back of his vessel, one of whom was struck by the propeller.
- A boat operator was maneuvering in a tight turn to retrieve a skier. The ski observer was sitting on the edge of the boat in the bow area. The vessel did not have any side rails. The observer fell overboard during the turn and was run over by the vessel. He suffered severe head injuries and was air lifted to the hospital.

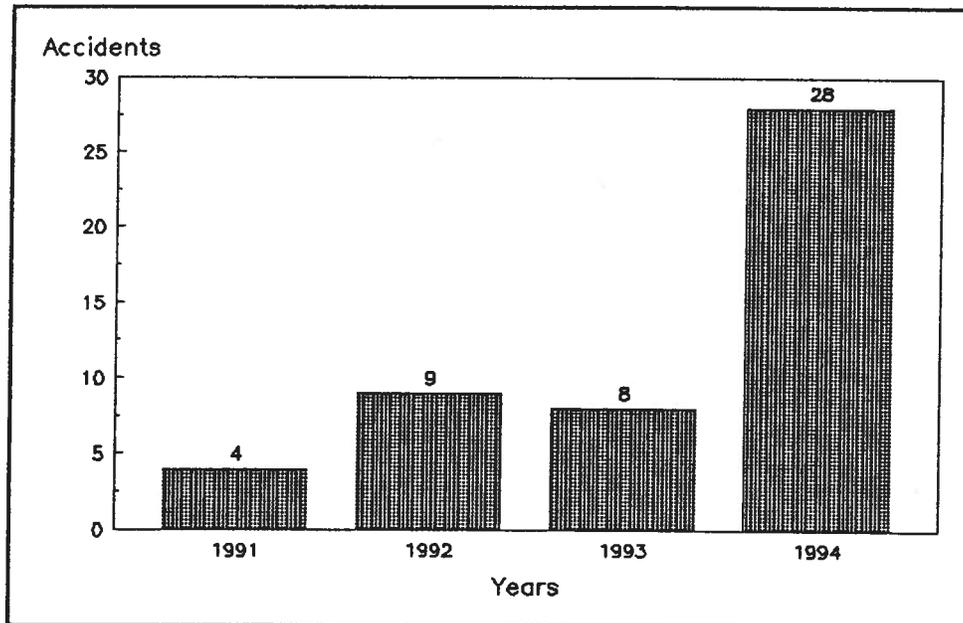
- Two 13-year-old boys were operating a motorized inflatable vessel in circles. They both fell overboard and hung onto the side of the vessel. The legs of one of them were sucked into the propeller.

Findings

Vessel propellers were involved in 28 accidents in 1994, which caused some very serious injuries and contributed to one fatality. Ten accidents occurred during water-skiing activities and 18 took place during other boating activities.

The number of accidents involving propeller cuts has risen over the last several years. The chart below details the increase in accidents involving propeller cuts from 1991 to 1994.

TABLE 10
INCREASE IN ACCIDENTS INVOLVING BOAT PROPELLERS



When a person falls overboard while bow riding, it is often the case that he or she is sucked underneath the boat and directly into the path of the propeller. It is the responsibility of the vessel operator to ensure that all passengers are in a safe position inside the vessel while underway.

An error that boat operators often make is to assume that the boat propeller will not turn or spin if the vessel is in neutral. If the vessel has momentum, the propeller will still turn while in neutral. Several accidents occurred when swimmers and skiers jumped overboard and were cut by turning propellers on boats that were in neutral. For safety purposes, boat operators should always turn the engine off before approaching skiers or allowing people to exit the vessel from the rear of the boat.

Propeller Guards

Injuries and fatalities caused by propellers on recreational vessels have been studied by a variety of groups for a number of years. A controversy surrounding this issue concerns the use of propeller guards which may or may not offer protection to persons in the water. National organizations including the U.S. Coast Guard, the Underwriters Laboratories and the National Boating Safety Advisory Council have addressed this issue. Currently, the U.S. Coast Guard is requesting information on accidents involving propellers on houseboats and other displacement-type recreational vessels. There are two divergent opinions regarding the use of propeller guards. One opinion is that they are dangerous and can cause blunt trauma injuries upon impact. The other opinion is that propeller guards should be required in all vessels and that they offer significant protection to boaters. More information is needed regarding propeller guards before a conclusion can be drawn as to the advisability of their use.

Recommendations

Since accidents involving boat propellers are increasing, the Department needs to better educate boaters on safety measures concerning them. The Department will include safety information in the "ABCs of California Boating" that is provided with the vessel registration as well as in the "Safety Hints for Water-Skiing" pamphlet.

RESCUE

A tragic accident in 1994 claimed the lives of four U.S. Coast Guard crew members of a rescue helicopter when it smashed into a 500-foot cliff on the coast of Humboldt County. The Dolphin helicopter had taken off from the Humboldt Bay Coast Guard base near Eureka around 4 a.m. on July 12 in answer to an emergency call from a 37-foot recreational sailboat stranded along the rocky shoreline in Shelter Cove, 160 miles north of San Francisco. When Coast Guard dispatchers at the Humboldt Bay Command Center could not raise the rescue craft on the radio, a second helicopter was launched along with a C-130 plane from San Francisco and a 44-foot motorized lifeboat from Fort Bragg. A Coast Guard crew found the wreckage of the Dolphin rescue helicopter at the base of a steep cliff about two miles from the center of Shelter Cove. All crew members aboard were killed in the crash. The Coast Guard later reported that there were no eye-witnesses to the accident.

The sailboat that sent the distress call was able to navigate to safety without assistance. Reports indicate that the crew of this craft was operating in unfamiliar waters and ran into the rocky shoreline.

This incident points out the importance of vessel operators taking all possible safety precautions prior to venturing out in unfamiliar or difficult conditions. The danger associated with this incident extended far beyond the occupants of the sailing vessel and took the lives of this Coast Guard crew whose duties required them to launch into very difficult weather conditions. Boat operators should be aware that emergency response teams will launch in very unsafe conditions that would normally preclude them from venturing out.

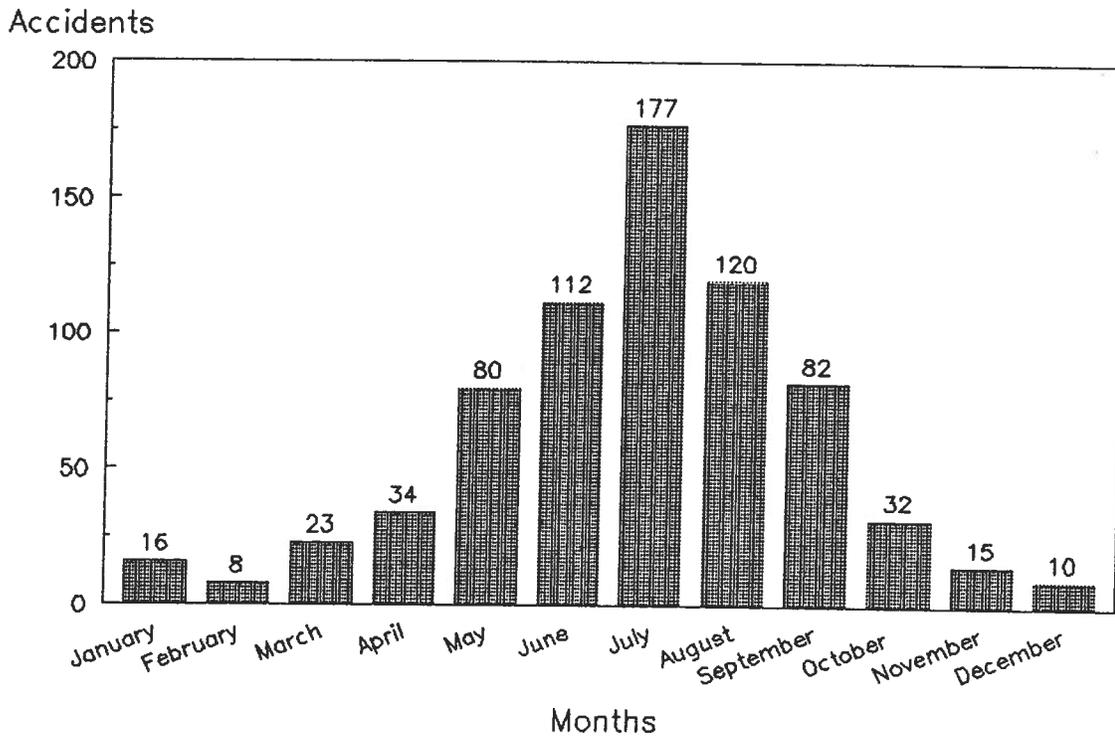
Small craft operators should consider carefully the chain of events they set in motion when they boat in rough or unfamiliar conditions. The loss of life of the rescue personnel in this incident is a vivid example.

ACCIDENT

DATA

CHARTS

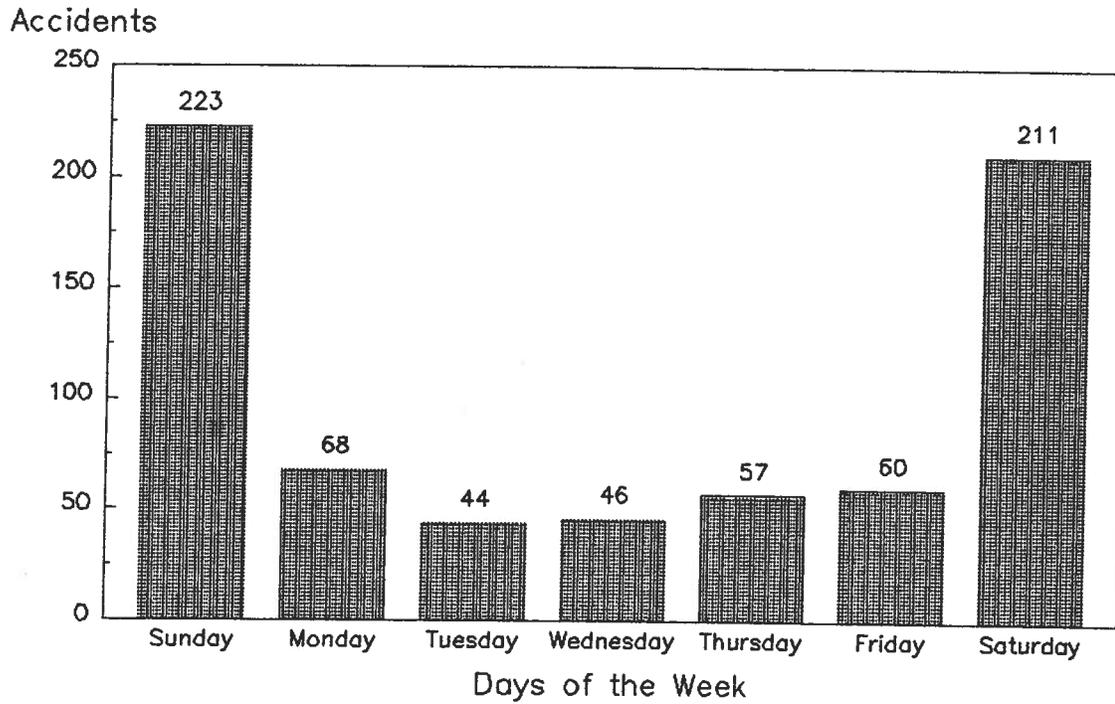
ACCIDENTS BY MONTH



Accidents= 709

The findings on this chart reveal that most boating accidents occurred from May through September, with the highest number occurring in July.

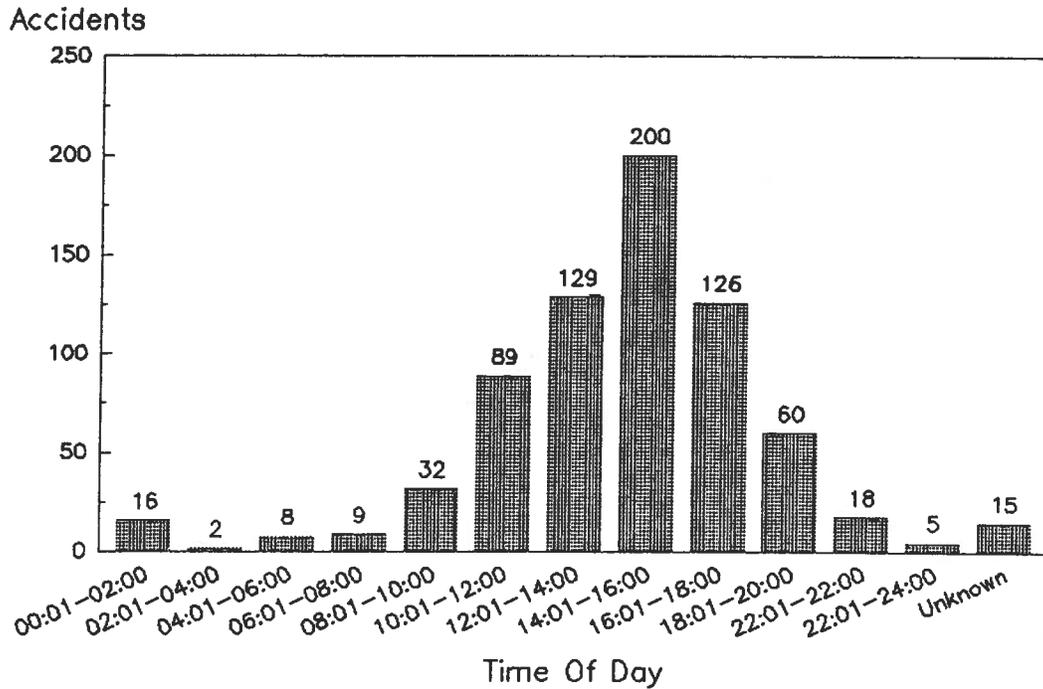
ACCIDENTS BY DAY OF THE WEEK



Accidents= 709

This chart reveals that most accidents happened during the weekend.

ACCIDENTS BY TIME OF DAY



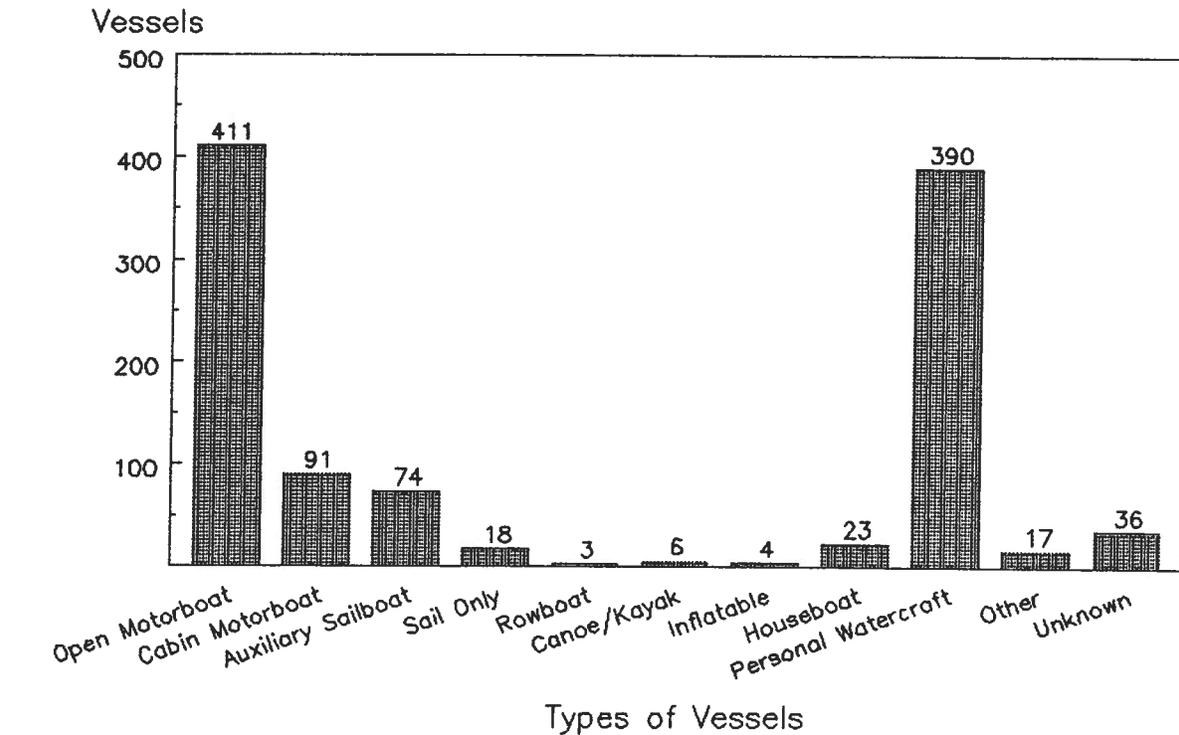
Accidents= 709

24-Hour Clock

Time on this chart is represented by a 24-hour clock. Time progresses normally through 12 noon. After noon, add one hundred for each additional hour. One p.m. becomes 1300 hours, etc.

This chart reveals that from midday to late afternoon was the most dangerous time to go boating. This is the time when the waterways would be expected to be the most congested, resulting in an increased chance of collision.

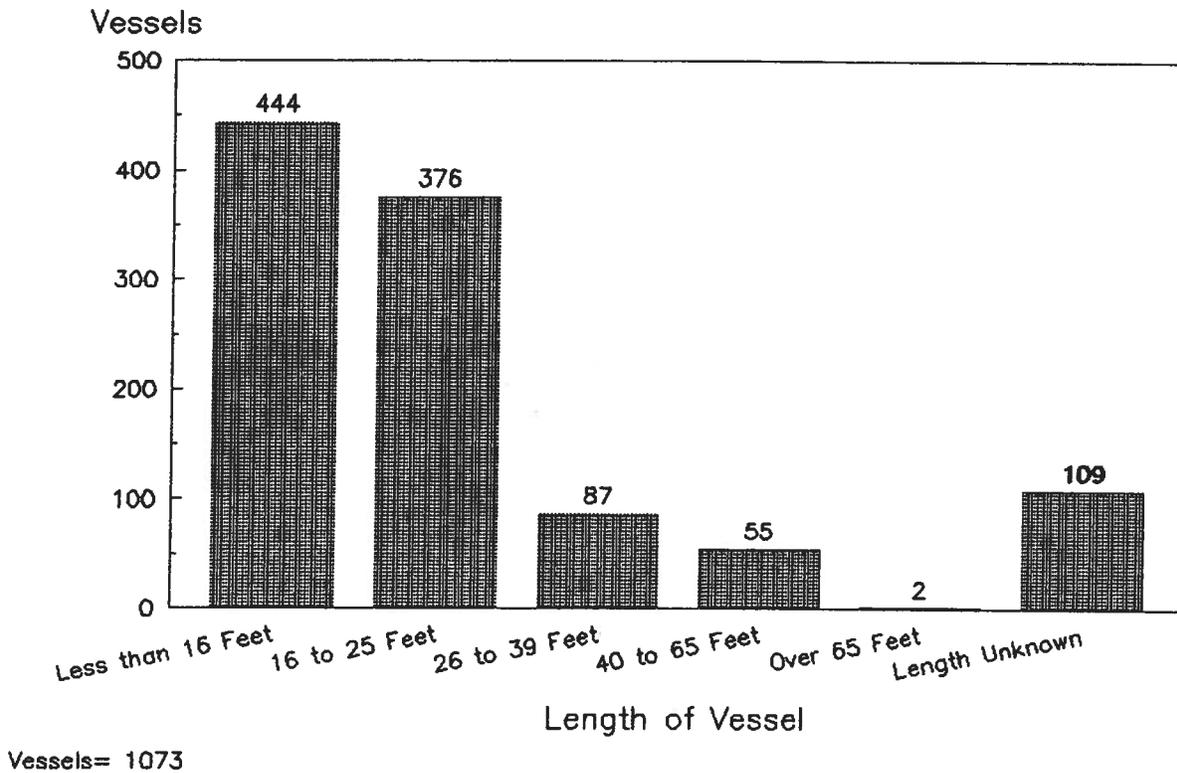
TYPE OF VESSEL



Vessels= 1073

Open motorboats and personal watercraft made up the majority of vessels involved in accidents. Open motorboats represented 38% of these vessels and personal watercraft represented 36%.

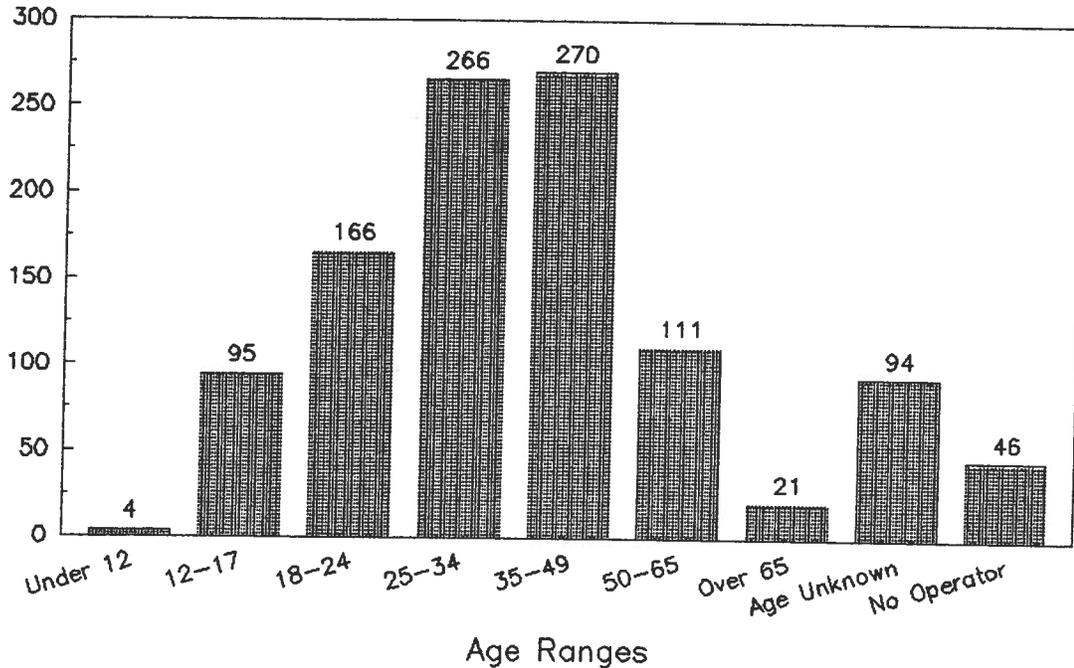
LENGTH OF VESSEL



Vessels less than 16 feet were involved in more accidents than vessels in any other category.

AGE OF OPERATOR

Operators Involved in Accidents



Operators= 1027
Vessels= 1073

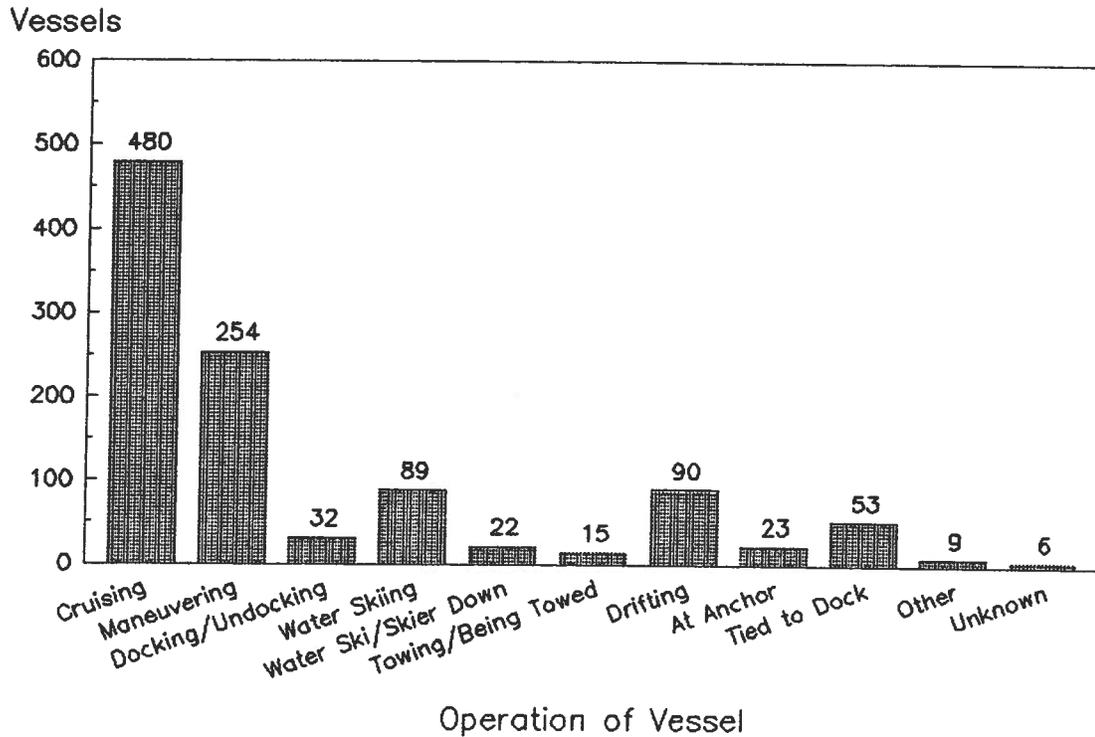
Operators from the 35-49 age group were involved in more accidents than any other age group. This group was closely followed by the 25-34 age group.

"No Operator" refers to accidents involving vessels where there was no operator present at the time of the accident. Most of these vessels were in vessel slips, tied to docks, or moored, and were struck by other vessels.

Some accident reports submitted to the Department do not include operator age information, as indicated by the "Age Unknown" category.

A detailed age breakdown for operators under 18 years of age is available on page 13 of this report.

OPERATION AT TIME OF ACCIDENT

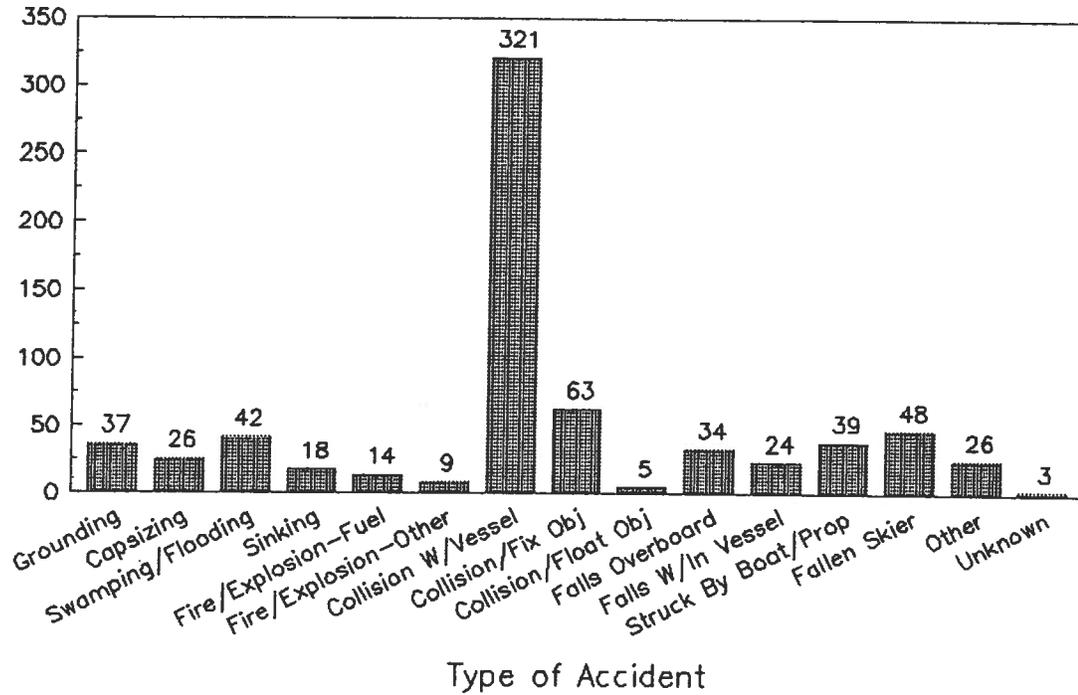


Vessels= 1073

Cruising was the most common type of vessel operation preceding accidents, followed by maneuvering.

TYPE OF ACCIDENT

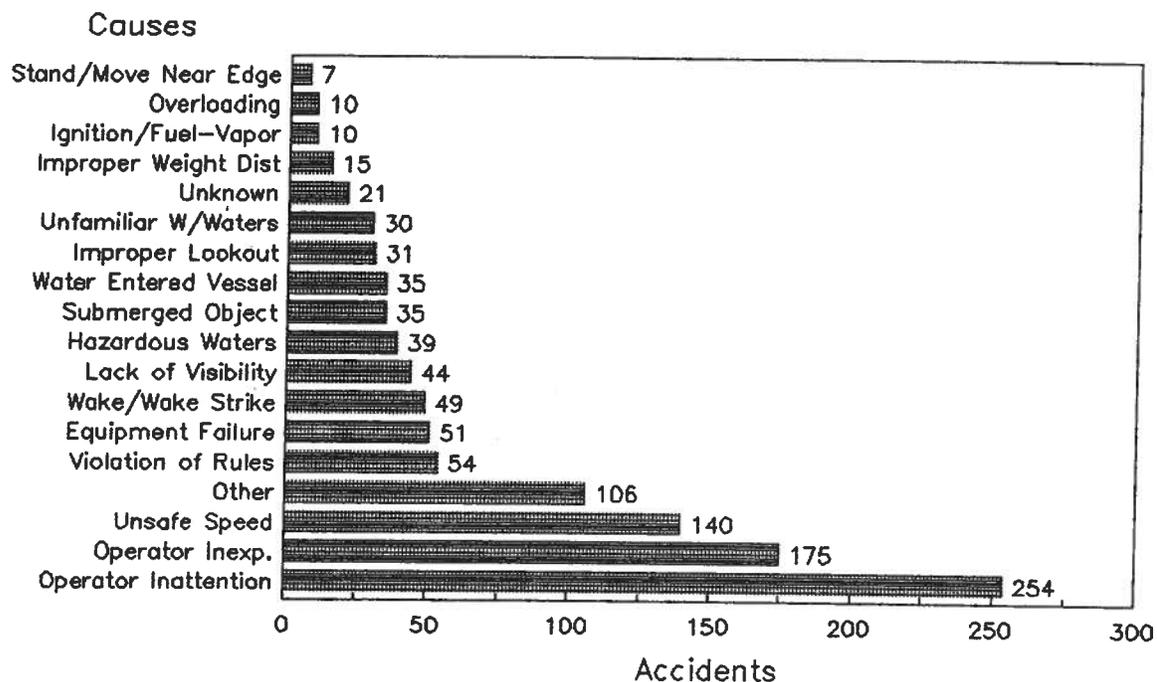
Accidents



Accidents= 709

The leading cause of accidents involved vessels colliding with other vessels.

CAUSE OF ACCIDENT



Causes= 1106

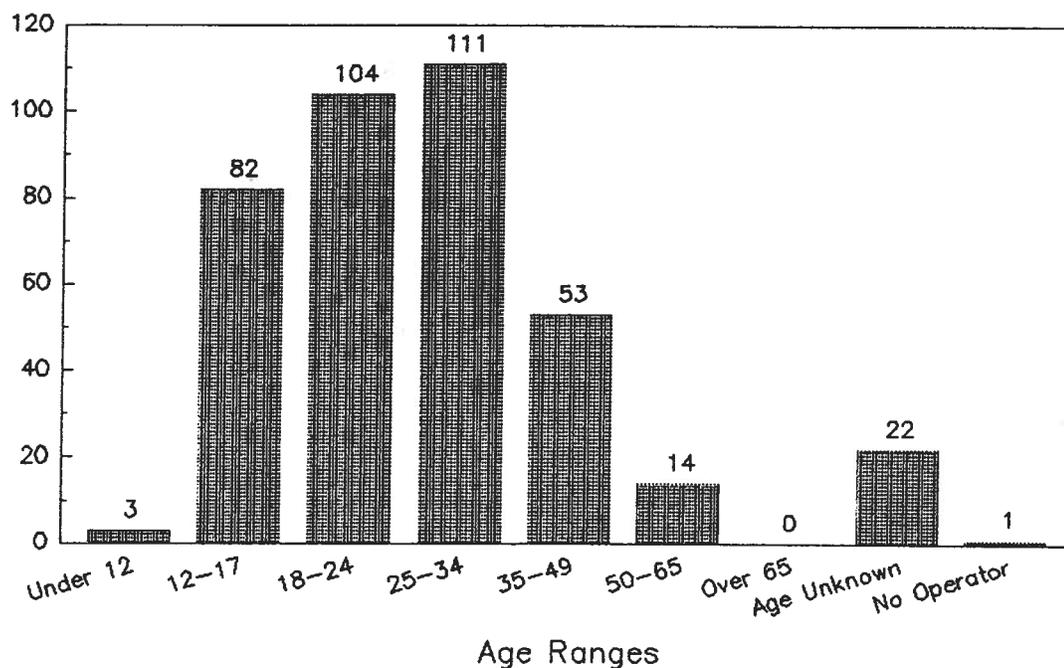
This chart reflects that many accidents had more than one cause. The leading cause of boating accidents was inattention on the part of the vessel operator, followed by operator inexperience.

The category "Improper Lookout" includes accidents where ski observers were not present or failed to do their job, and sailing accidents where lookouts were not posted or failed to do their job. In the report, *California Boating Accident Report For 1993*, this term included all types of accidents caused by inattentiveness or failure to perceive danger.

The category "Other" includes an assortment of causes that do not fit into any of the listed categories.

AGE OF OPERATOR PERSONAL WATERCRAFT ACCIDENTS

Operators Involved in Accidents



Vessels= 390
Operators= 389

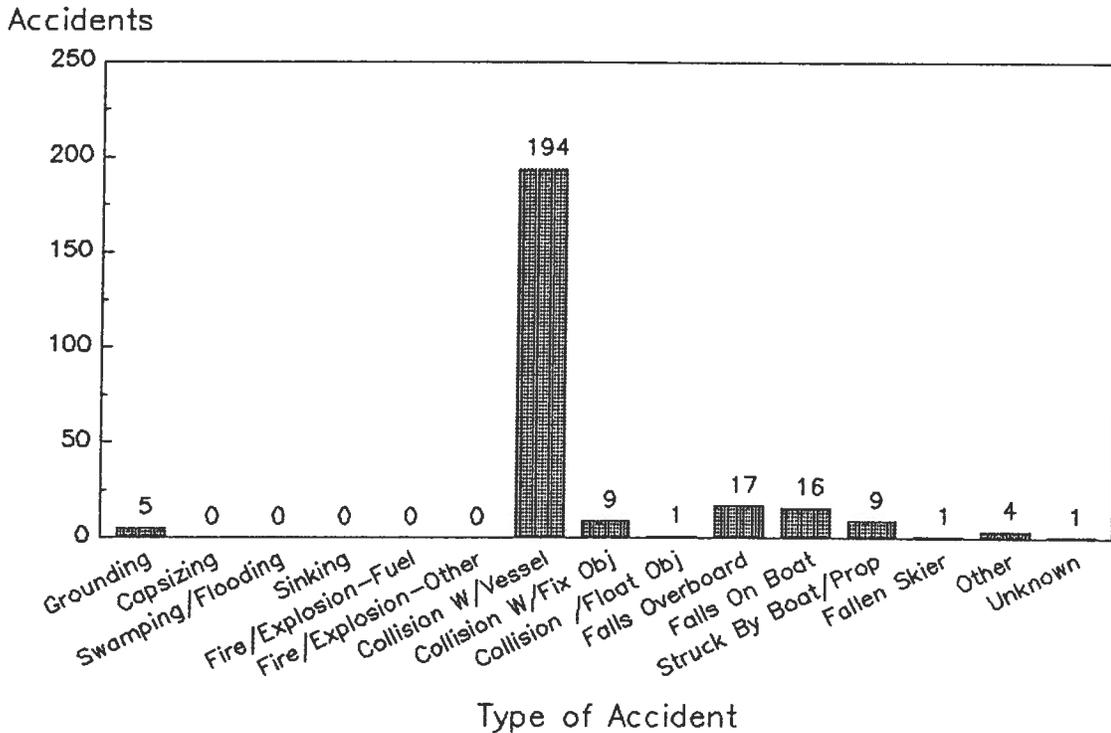
Operators from the 25-34 age group were involved in more accidents than any other age group. This group was closely followed by the 18-24 age group.

"No operator" refers to accidents in which there was no operator present at the time of the accident. This category refers mostly to vessels that were in vessel slips, tied to docks, or moored, and were struck by other vessels. Because PWC do not tend to be housed in slips, due to their small size, the number of vessels found in this category is much lower than the number found on the chart on page 45.

Some accident reports submitted to the Department do not include operator age information, as indicated by the "Age Unknown" category.

A detailed age breakdown for operators under 18 years of age is available on page 13 of this report.

TYPE OF ACCIDENT PERSONAL WATERCRAFT ACCIDENTS

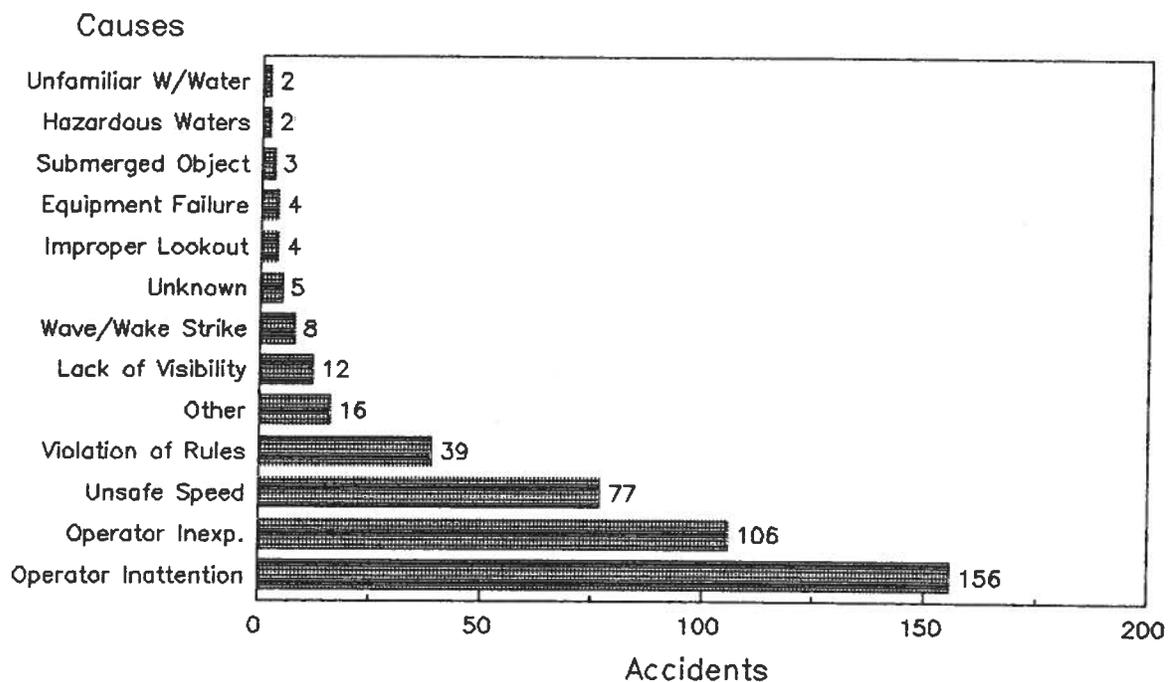


Accident= 257

The majority of personal watercraft accidents involved PWC colliding with other vessels, usually other PWC.

The "Falls On Boat" category represents PWC operators who became separated from their craft and then fell back on top of it. This kind of occurrence normally takes place during wake-jumping activities.

CAUSE OF ACCIDENT PERSONAL WATERCRAFT ACCIDENTS



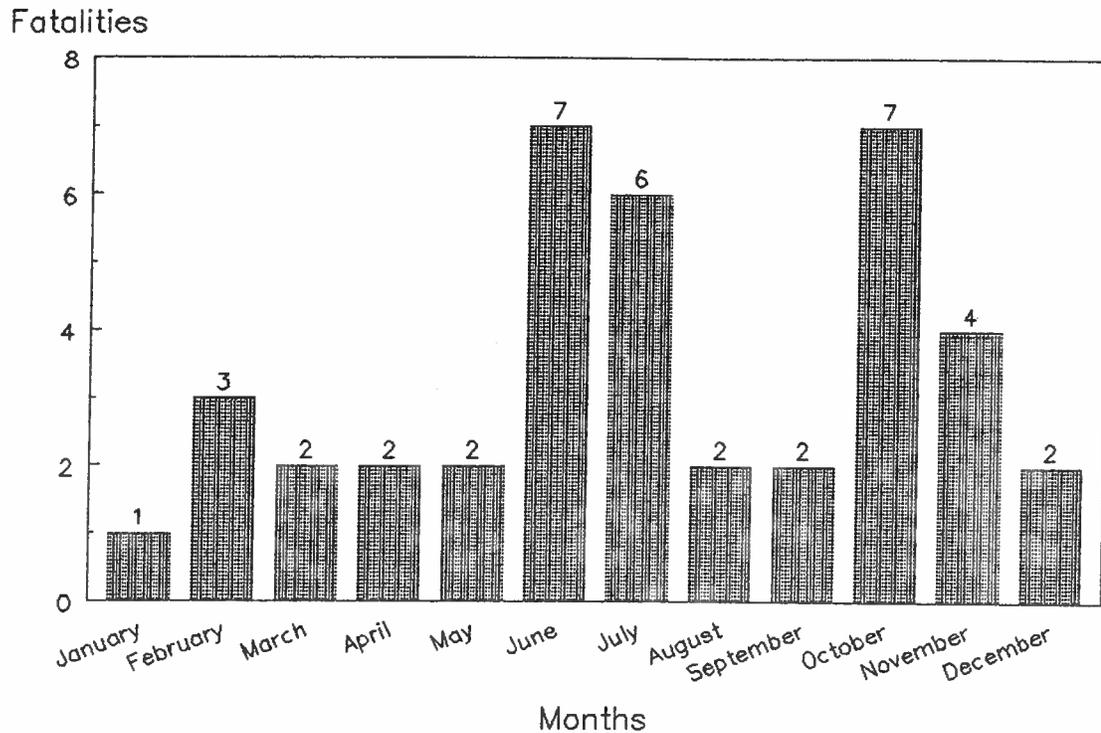
Causes= 434

This chart reflects the fact that many personal watercraft accidents had more than one cause. The leading cause of boating accidents was operator inattention, followed by operator inexperience.

The category "Improper Lookout" includes accidents where ski observers were not present or failed to do their job, and sailing accidents where lookouts were not posted or failed to do their job. In the report, *California Boating Accident Report For 1993*, this term included all types of accidents caused by inattentiveness or failure to perceive danger.

The category "Other" includes an assortment of causes that do not fit into any of the listed categories.

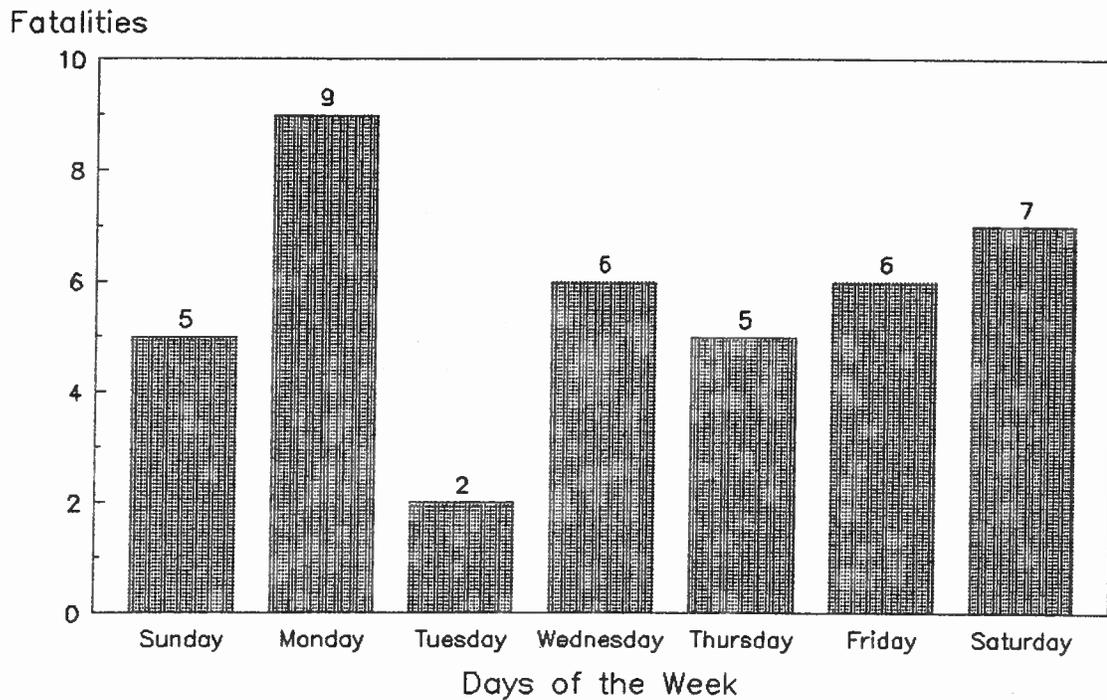
ACCIDENTS BY MONTH BOATING FATALITIES



Fatalities= 40

In 1994, an unusual number of fatalities occurred during the month of October. Three fatalities occurred over the Columbus Day three-day holiday weekend, which accounted for nearly half of the total for the month. The majority of October fatalities occurred in Southern California.

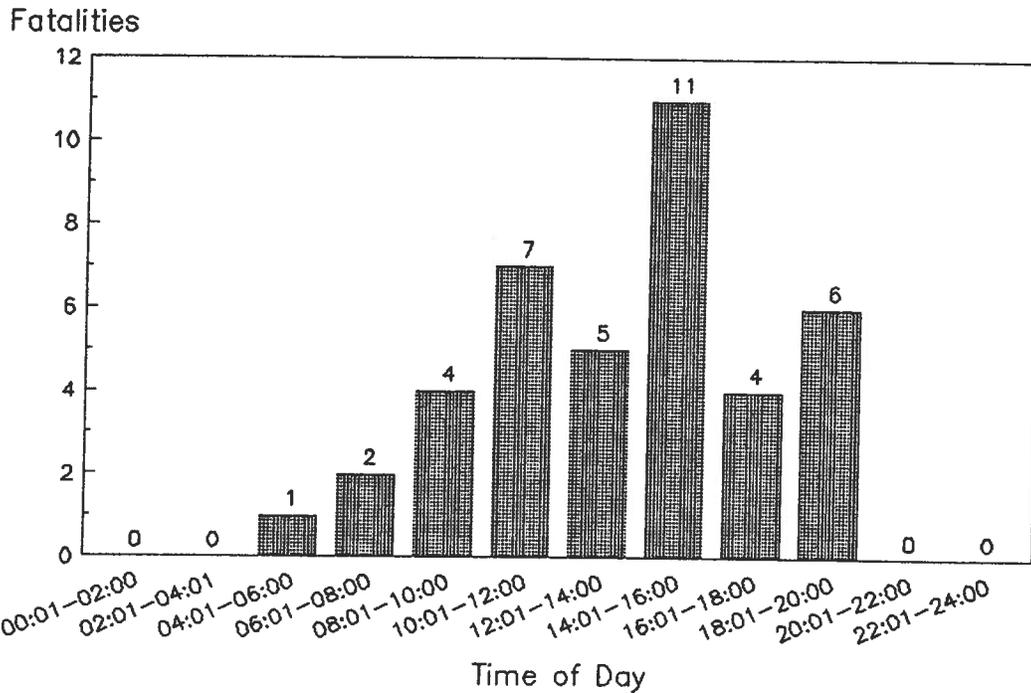
ACCIDENTS BY DAY OF THE WEEK BOATING FATALITIES



Fatalities= 40

The largest number of fatalities occurred on Monday. Four fatalities occurred on the Monday of a three-day holiday weekend. One occurred on Memorial Day, one on the 4th of July, and one accident, a double fatality, occurred on the day after Christmas. Unlike the other holidays, the day after Christmas is not a popular boating day, with a large number of accidents.

ACCIDENTS BY TIME OF DAY BOATING FATALITIES



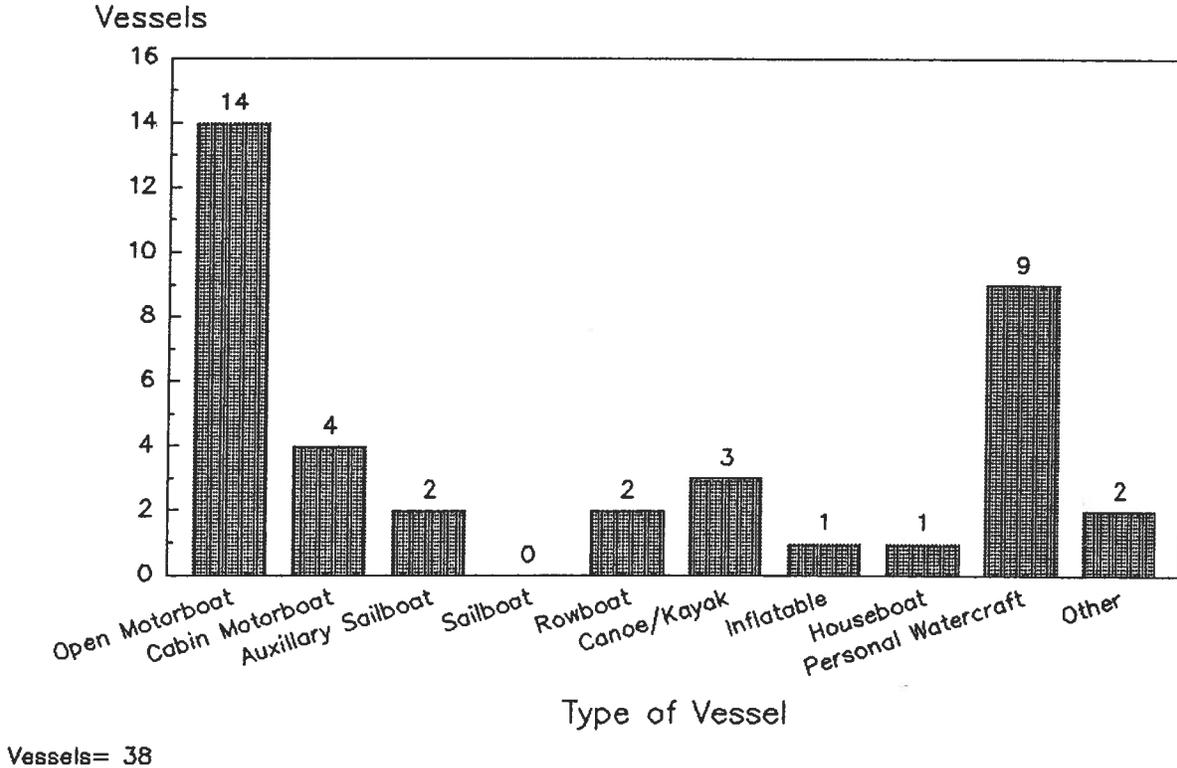
Fatalities= 40

24-Hour Clock

Time on this chart is represented by a 24-hour clock. Time progresses normally through 12 noon. After noon, add one hundred for each additional hour. One p.m. becomes 1300 hours, etc.

More accidents occurred between 2:01 and 4:00 p.m. than during any other time period.

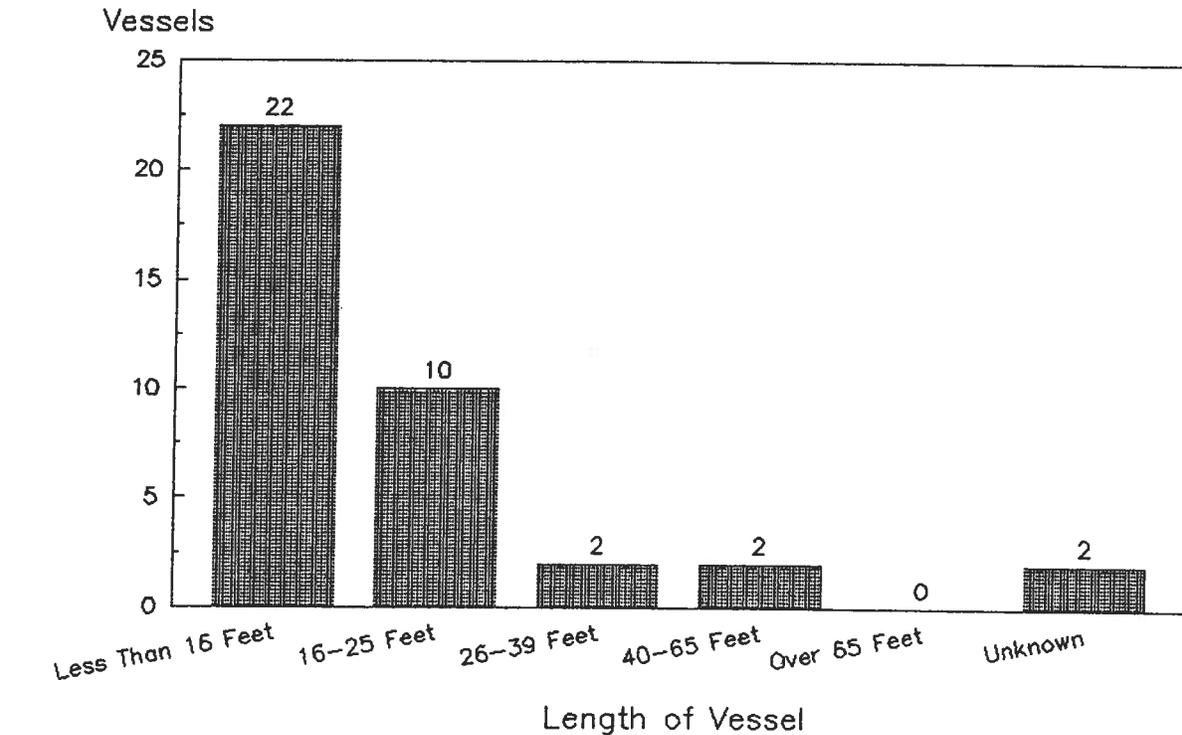
TYPE OF VESSEL BOATING FATALITIES



The majority of vessels involved in fatal boating accidents were open motorboats.

Although there were no whitewater fatalities in 1994, several paddle craft were involved in accidents in calm water situations.

LENGTH OF VESSEL BOATING FATALITIES

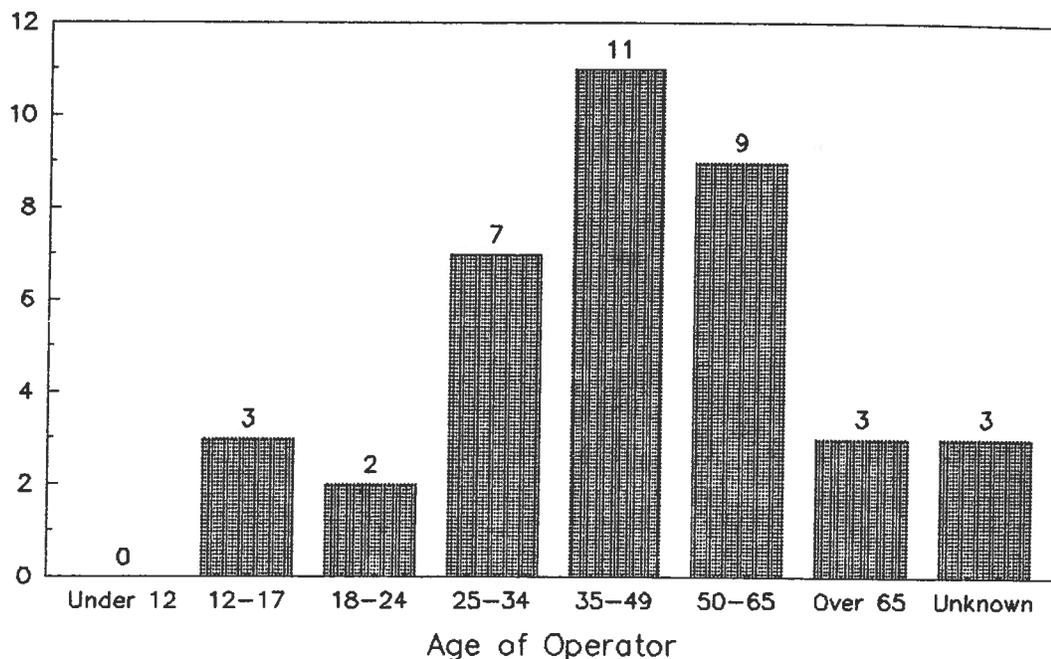


Vessel= 38

The majority of vessels involved in fatal accidents were less than 16 feet in length followed by vessels 16-25 feet in length. This finding is consistent with the chart on page 44 showing the lengths of all vessels involved in boating accidents.

AGE OF OPERATOR BOATING FATALITIES

Operators Involved in Fatalities

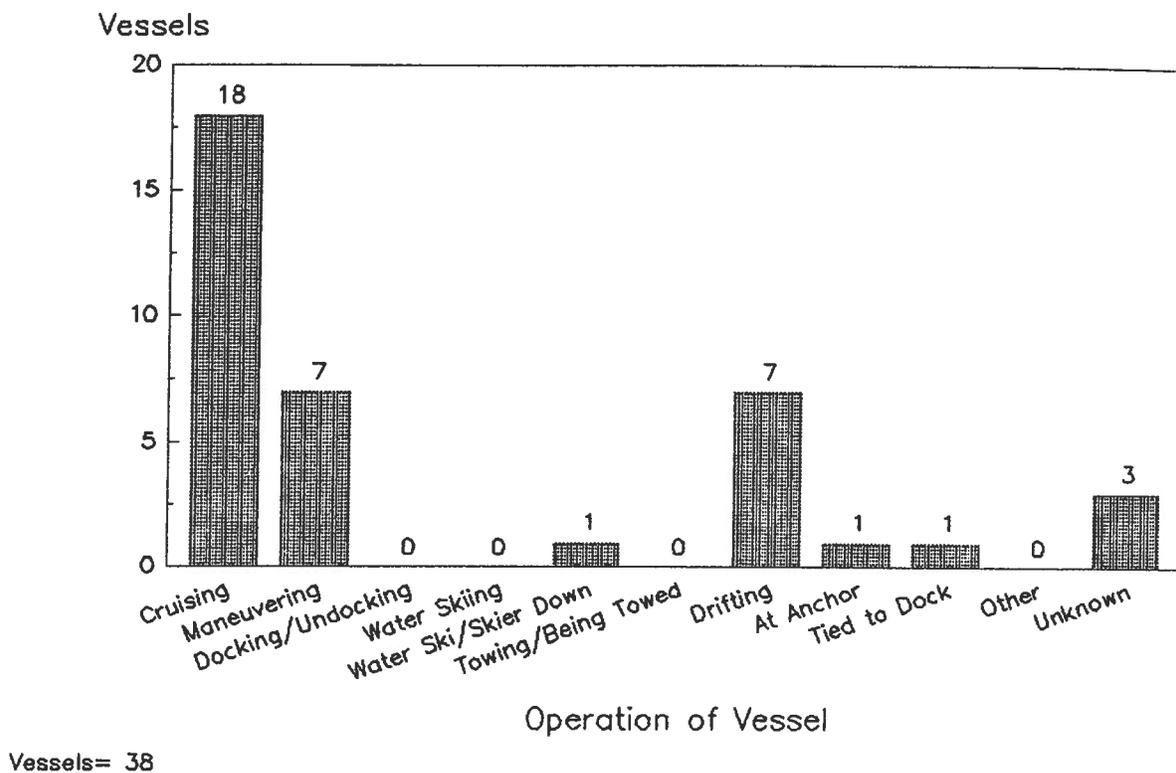


Operators= 38

In the unknown category, two of the accidents were single-vessel accidents with no witnesses. Each vessel had two occupants, and it is unknown which individual was operating the vessel. The third accident involved a hit-and-run collision between two PWC. The age of the hit-and-run vessel operator is unknown, as he was never apprehended.

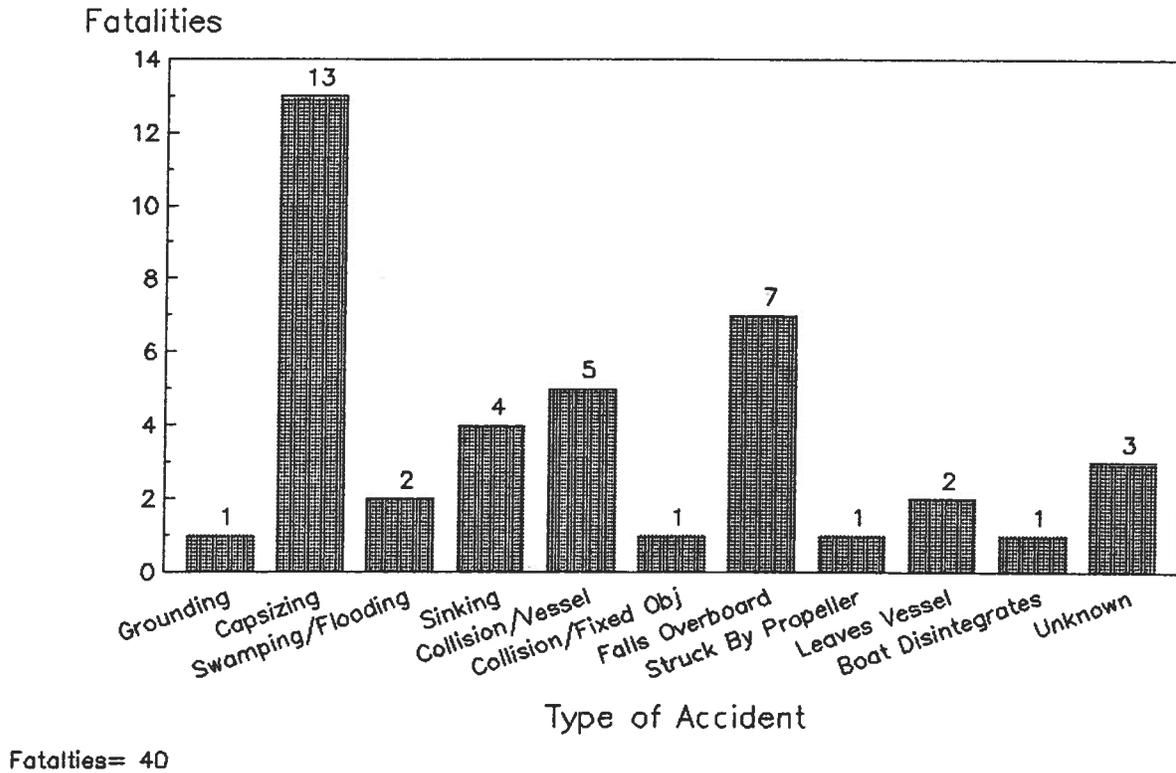
A detailed age breakdown for operators under 18 years of age is available on page 13 of this report.

OPERATION AT TIME OF ACCIDENT BOATING FATALITIES



The most common type of vessel operation prior to fatal boating accident was cruising, followed by maneuvering.

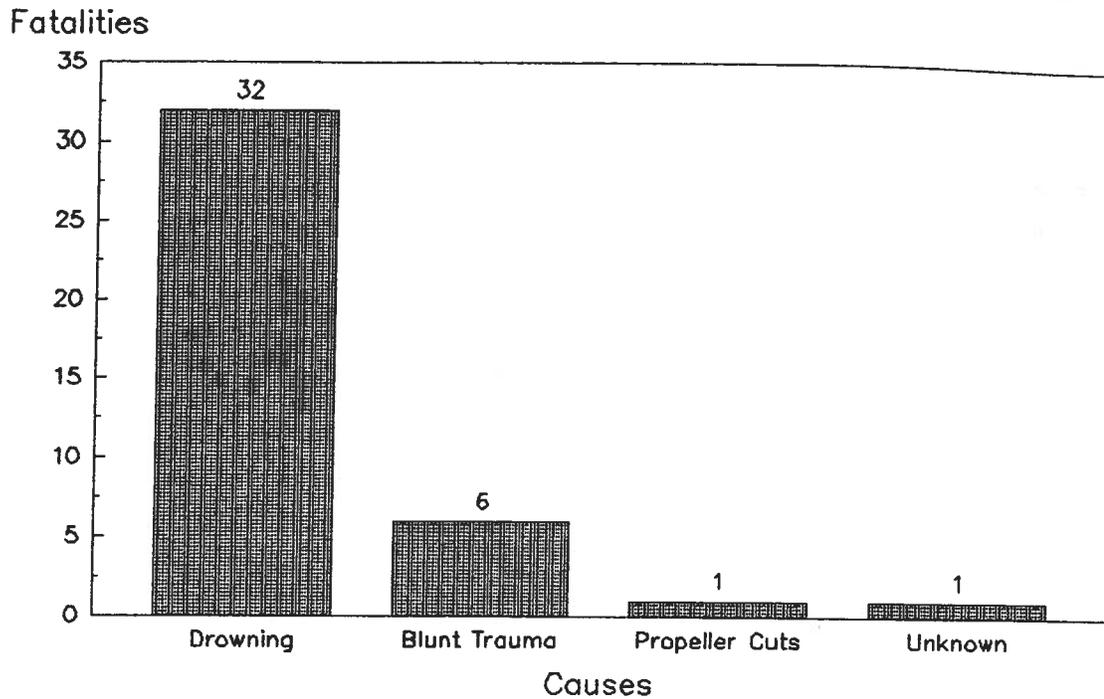
TYPE OF ACCIDENT BOATING FATALITIES



The most common type of fatal accident involved vessels capsizing followed by falls overboard.

The category "Leaves Vessel" describes situations where victims left vessels to attempt to rescue other individuals and subsequently drowned.

CAUSE OF DEATH

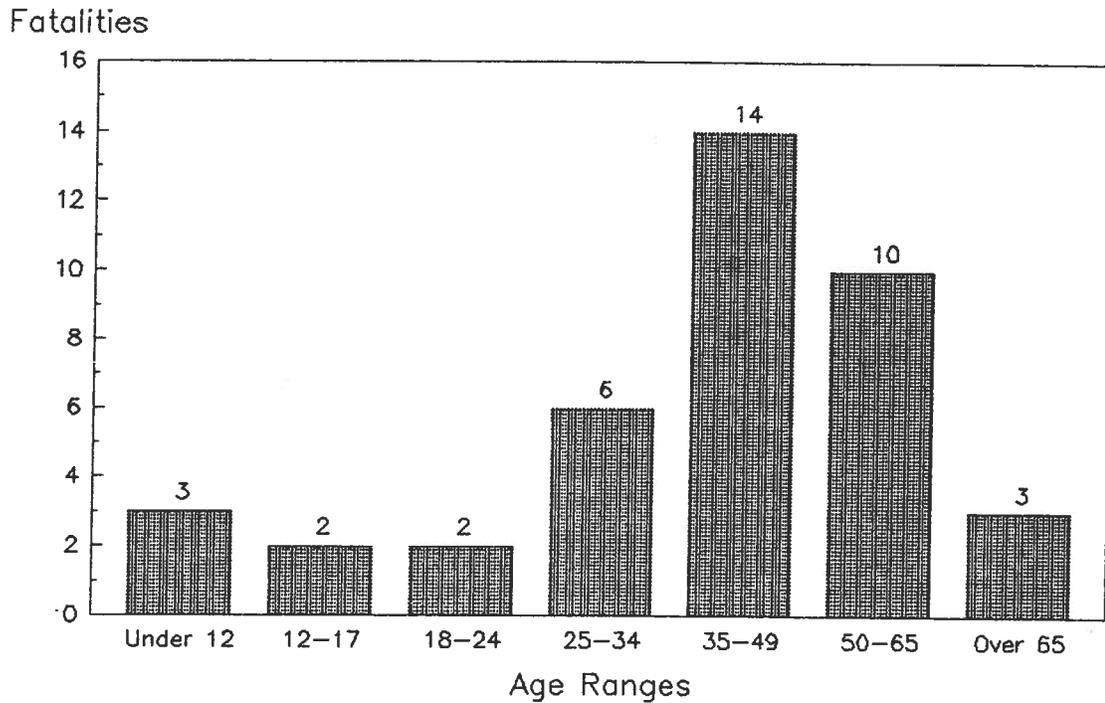


Fatalities= 40

Drowning was the leading cause of death in boating fatalities. Accident data revealed that 75% of the victims who drowned in 1994 were not wearing life jackets. (Please see the section of this report labeled "Personal Flotation Devices" for more information.)

The category "Unknown" contains an accident where the victim's body was never found and there were no witnesses to the accident.

AGE OF VICTIM BOATING FATALITIES



Fatalities= 40

More people died in the 35-49 age group than in any other age group.

Glossary of Boating Terms

At Anchor - Held in place in the water by an anchor; includes "moored" to a buoy or anchored vessel and "dragging anchor."

Cabin Motorboat - Motorboats with a cabin which can be completely closed by means of doors or hatches.

Capsizing - Overturning of a vessel. The bottom must become uppermost, except in the case of a sailboat, which lies on its side.

Collision with Fixed Object - The striking of any fixed object, above or below the surface of the water.

Collision with Floating Object - Collision with any waterborne object above or below the surface of the water

Cruising - Proceeding normally, unrestricted, with an absence of drastic rudder or engine changes.

Drifting - Underway, but proceeding over the bottom without use of engines, oars or sails; being carried along only by the tide, current, or wind.

Fire/Explosion (Fuel) - Accidental combustion of vessel fuel, liquids, including their vapors.

Fire/Explosion (Other) - Accidental burning or explosion of any materials on board, except vessel fuels or their vapors.

Flooding/Swamping - Filling with water, but retaining sufficient buoyancy to remain on the surface.

Grounding - Running aground of a vessel, striking or pounding on rocks, reefs, or shoals.

Improper Lookout* - No proper watch; the failure of an operator to perceive danger because no one was serving as a lookout, or the person so serving failed to do so. (For purposes of this report, this term refers only to accidents where ski observers

were not present or failed to do their job, or sailboat accidents where a lookout was not posted or failed to perceive danger. All other accidents involving inattentive operators fall under "Operator Inattention."

Maneuvering - Changing of course, speed, or similar boat handling action during which a high degree of alertness is required.

Open Motorboat - Craft of open construction specifically built for operating with a motor, including boats canopied or fitted with temporary partial shelters.

Rules of the Road - Statutory and regulatory rules governing navigation of vessels.

Unsafe Speed - Operating at a speed that is not reasonable or prudent considering the circumstances.

* In the report, *California Boating Accident Report for 1993*, the term "improper lookout" included all types of accidents that were caused by failure to perceive danger or inattentiveness.

These definitions were taken or adapted from the United States Coast Guard's publication, "Boating Statistics, 1993."

CALIFORNIA BOATING ACCIDENT REPORT

THE OPERATOR OF EVERY RECREATIONAL VESSEL IS REQUIRED BY SECTION 656 OF THE HARBORS AND NAVIGATION CODE TO FILE A WRITTEN REPORT WHENEVER A BOATING ACCIDENT OCCURS WHICH RESULTS IN DEATH, DISAPPEARANCE, INJURY THAT REQUIRES MEDICAL TREATMENT BEYOND FIRST AID, TOTAL PROPERTY DAMAGE IN EXCESS OF \$500, OR COMPLETE LOSS OF A VESSEL. REPORTS MUST BE SUBMITTED WITHIN FORTY-EIGHT (48) HOURS IN CASE OF DEATH OCCURRING WITHIN 24 HOURS OF THE ACCIDENT, DISAPPEARANCE, OR INJURY THAT REQUIRES MEDICAL TREATMENT BEYOND FIRST AID. ALL OTHER REPORTABLE ACCIDENTS MUST BE SUBMITTED IN WRITING WITHIN TEN (10) DAYS. REPORTS ARE TO BE SUBMITTED TO THE DEPARTMENT OF BOATING AND WATERWAYS, 1629 S STREET, SACRAMENTO, CA 95814-7291, (916) 322-1833. FAILURE TO SUBMIT THIS REPORT AS REQUIRED IS A MISDEMEANOR AND IS PUNISHABLE BY A FINE NOT TO EXCEED ONE THOUSAND DOLLARS (\$1,000) OR IMPRISONMENT NOT TO EXCEED SIX (6) MONTHS OR BOTH.

COMPLETE ALL BLOCKS

(PRINT OR TYPE ALL INFORMATION. INDICATE THOSE NOT APPLICABLE BY "NA." THOSE UNKNOWN BY "UN.")

1. OPERATOR'S NAME AND ADDRESS AGE _____ HOME PHONE () WORK PHONE ()		2. RENTED BOAT <input type="checkbox"/> YES <input type="checkbox"/> NO	3. OPERATOR'S EXPERIENCE THIS TYPE OF BOAT <input type="checkbox"/> UNDER 20 HOURS <input type="checkbox"/> OTHER BOAT OPERATING EXPERIENCE <input type="checkbox"/> 20 TO 100 HOURS <input type="checkbox"/> UNDER 20 HOURS <input type="checkbox"/> 100 TO 500 HOURS <input type="checkbox"/> 20 TO 100 HOURS <input type="checkbox"/> OVER 500 HOURS <input type="checkbox"/> 100 TO 500 HOURS <input type="checkbox"/> OVER 500 HOURS <input type="checkbox"/> OVER 500 HOURS
4. OWNER'S NAME AND ADDRESS HOME PHONE () WORK PHONE ()		5. NUMBER OF PERSONS ON BOARD 6. NUMBER OF PERSONS TOWED (I.E. SKIING ETC.)	7. FORMAL INSTRUCTION IN BOATING SAFETY <input type="checkbox"/> NONE <input type="checkbox"/> AMERICAN RED CROSS <input type="checkbox"/> USCG AUXILIARY <input type="checkbox"/> STATE <input type="checkbox"/> US POWER SQUADRON <input type="checkbox"/> OTHER (SPECIFY)

VESSEL NO. 1 (YOUR VESSEL)

8. BOAT NUMBER	9. BOAT NAME	10. BOAT MANUFACTURER	11. BOAT MODEL	12. MFGR. HULL IDENT. NO.
13. TYPE OF BOAT <input type="checkbox"/> OPEN MOTORBOAT <input type="checkbox"/> CABIN MOTORBOAT <input type="checkbox"/> AUXILIARY SAIL <input type="checkbox"/> SAIL ONLY <input type="checkbox"/> HOUSEBOAT <input type="checkbox"/> RAFT <input type="checkbox"/> CANOE <input type="checkbox"/> KAYAK <input type="checkbox"/> JET SKI/WETBIKE <input type="checkbox"/> ROWBOAT <input type="checkbox"/> OTHER (SPECIFY) _____	14. HULL MATERIAL <input type="checkbox"/> WOOD <input type="checkbox"/> ALUMINUM <input type="checkbox"/> STEEL <input type="checkbox"/> FIBERGLASS <input type="checkbox"/> RUBBER/VINYL <input type="checkbox"/> PLASTIC <input type="checkbox"/> OTHER (SPECIFY) _____	15. PROPULSION <input type="checkbox"/> OUTBOARD <input type="checkbox"/> INBOARD <input type="checkbox"/> INBOARD-OUTBOARD <input type="checkbox"/> JET <input type="checkbox"/> SAIL <input type="checkbox"/> PADDLE/OARS <input type="checkbox"/> OTHER (SPECIFY) _____ TYPE OF FUEL _____	16. BOAT DATA NUMBER OF ENGINES _____ LENGTH _____ MAKE OF ENGINE _____ BEAM (WIDTH) _____ HORSEPOWER (TOTAL) _____ DEPTH (TOP OF INNER TRANSOM TO KEEL) _____ YEAR BUILT (ENGINE) _____ YEAR BUILT (BOAT) _____	
17. PRIMARY BOAT USE <input type="checkbox"/> RECREATIONAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/> FOR-HIRE <input type="checkbox"/> WORK BOAT			18. PREVIOUS ACCIDENTS INVOLVING THIS BOAT DATES _____	

VESSEL NO. 2 (OTHER VESSEL INVOLVED)

19. BOAT NUMBER	20. BOAT NAME	21. BOAT MANUFACTURER	22. BOAT MODEL	23. MFGR. HULL IDENT. NO.
24. NAME OF OPERATOR AGE _____ HOME PHONE () WORK PHONE ()		25. ADDRESS _____ _____		
26. NAME OF OWNER HOME PHONE () WORK PHONE ()		27. ADDRESS _____ _____		

WITNESSES

NAME	AGE _____	ADDRESS	TELEPHONE NUMBER ()
NAME	AGE _____	ADDRESS	TELEPHONE NUMBER ()
NAME	AGE _____	ADDRESS	TELEPHONE NUMBER ()

ACCIDENT DATE AND LOCATION

29. DATE OF ACCIDENT	30. TIME ____ AM ____ PM	31. NAME OF BODY OF WATER 32. LAST PORT OF CALL	33. LOCATION (AS PRECISELY AS POSSIBLE)
34. STATE	35. NEAREST CITY OR TOWN	36. COUNTY	

ENVIRONMENTAL CONDITIONS

37. WEATHER <input type="checkbox"/> CLEAR <input type="checkbox"/> RAIN <input type="checkbox"/> CLOUDY <input type="checkbox"/> SNOW <input type="checkbox"/> FOG <input type="checkbox"/> HAZY	38. WATER CONDITIONS <input type="checkbox"/> CALM <input type="checkbox"/> CHOPPY <input type="checkbox"/> ROUGH <input type="checkbox"/> VERY ROUGH <input type="checkbox"/> STRONG CURRENT	39. TEMPERATURE (ESTIMATE) AIR _____ °F WATER _____ °F	40. WIND <input type="checkbox"/> NONE <input type="checkbox"/> LIGHT (0 TO 6 MPH) <input type="checkbox"/> MODERATE (7 TO 14 MPH) <input type="checkbox"/> STRONG (15 TO 25 MPH) <input type="checkbox"/> STORM (25 MPH AND OVER)	41. VISIBILITY <input type="checkbox"/> GOOD <input type="checkbox"/> FAIR <input type="checkbox"/> POOR	42. WEATHER ENCOUNTERED <input type="checkbox"/> WAS AS FORECAST <input type="checkbox"/> NOT AS FORECAST <input type="checkbox"/> FORECAST NOT OBTAINED
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