

Washington State Drowning Prevention Project Year 2000 PFD Observation Results

Introduction

Reduction in the number of injuries and deaths due to submersion remains a top priority of the *Washington State Drowning Prevention Project*.¹ As a part of this effort, observation of personal flotation device (PFD) use among occupants of small boats was performed to monitor and evaluate the use of PFDs. By understanding where PFD use is greatest, as well as deficient, PFD use promotion and other drowning prevention activities can be made more effective.

Prior PFD observation studies of recreational boaters in the state of Washington were performed as part of the *Washington State Drowning Prevention Project* in 1995 and 1997.² The current study was performed in the spring and early summer of 2000 as a follow-up to those prior studies.

Methods

Seven of the eight designated Washington State Department of Health Emergency Medical/Trauma Prevention Regions were included, with one region (South Central) split into two sections, resulting in eight study regions. Within these eight study regions 34 designated observation sites across the state were selected as representative of Washington boating activity, with a focus on sites that had a lot of children in boats. Observation sites were located within 16 of 39 counties and included lakes, rivers, estuaries and bays. Both salt and freshwater sites were included. A total of 33 observers were recruited and trained by a statewide observation coordinator. Some observers performed observations as a part of their regular work schedules (i.e. sheriff marine patrols), while others were part of a volunteer effort (i.e. area drowning prevention coalitions). Training was held for observers at sites across the state to ensure that all observers were consistent in following prescribed observation study protocols, determining qualifying study subjects (i.e. boats of proper length), and reporting results.

A minimum of four observations per site was performed. Observations were conducted for 60 or 90 minutes, between 9am and 4pm, between April and the end of June 2000. Weekend days (Saturday and Sunday) and holiday weekdays (i.e. Memorial Day) were preferred to ensure adequate numbers of observations. Observations were limited to boats of 18 feet or less, with a maximum of six occupants per craft observed. Observers followed a standard protocol that included recording the site name and number, county, observer, date, day, start and end time, weather, precipitation, air temperature, water type and speed, as well as wind speed and water condition.

Information recorded was about type of watercraft: with options of motorboat, sailboat, row boat, canoe, kayak, raft, other/unknown, and jet skis (personal watercraft). Age categories were divided into <5 years, 5-14 years, and 15+ years old. Gender and PFD use were also recorded for each boat occupant. If gender, age, or PFD wearing could not be reasonably determined, then the “unable to determine” designation was used.

Analysis: occupants of jet skis were separately evaluated because Washington State law requires all personal watercraft users to wear a PFD.³ In addition, Intervention regions receiving direct funding and support from the *Washington State Drowning Prevention Project* were evaluated separately from the non-intervention region.

Results

A total of 7787 boaters were observed in the year 2000 study, 7762 of which data was complete for PFD use, age, gender, and craft type. Six hundred (600) personal watercraft operators and riders (jet skiers) were also documented, 599 for whom data was complete. Results are presented in tables in order to examine cumulative results of all regions observed, with breakdowns by age, gender, craft type, and region.

Across all regions, 29% of boaters used a PFD. Use was greatest among children <5 years old (95%), with the lowest use among 15+ years old (17%). Females were more likely to wear a PFD (36%) compared with males (25%). Kayakers had the highest use among boaters (87%), with motorboats having the lowest use (21%). PFD use in intervention regions was 29% compared with 28% in the non-intervention region. The Central Region had the highest use (45%) and the North Central Region had the lowest (18%).

Among persons on jet skis, PFD use was 98%, with 100% use among both <5 and 5-14 year olds. Males and females were equally likely to wear PFDs: 98% for both. The lowest observed rate within any region of PFD use among jet skiers was 95% (South Central Region - Yakima).

Most observations were made during 60-minute periods (72%). Almost 97 percent (96.7%) of observations were made on days with dry conditions, with 0.4% in mist or fog, and 2.9% in the rain. Conditions were sunny for 58%, partly cloudy for 32%, and cloudy for 10% of the observations. Air temperatures were in the 65-80°F range for 73% of observations, with 11% <65°, and 16% in the >80° range.

Fresh water sites comprised 93% of observations and 7% were at saltwater sites. Slightly over twenty eight percent (28.3%) of observations were on rivers/streams, 64.9% at lakes, 0.2% at an estuary, and 6.6% at bays. Water conditions were noted as calm for 13.8%, with a slight breeze for 69%, with gusts for 17%, and heavy wind for 0.2% of observations.

Table 1 Cumulative All Observed Regions PFD Use by Age

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
<5 Years	4.55%	(7)	95.45%	(147)	100%	(154)	<5 Years	0.00%	(0)	100.0%	(4)	100%	(4)
5-14 Years	25.02%	(338)	74.98%	(1013)	100%	(1351)	5-14 Years	0.00%	(0)	100.0%	(58)	100%	(58)
15+ Years	82.92%	(5161)	17.08%	(1063)	100%	(6224)	15+ Years	2.05%	(11)	97.95%	(525)	100%	(536)
Total	71.24%	(5506)	28.76%	(2223)	100%	(7729)	Total	1.84%	(11)	98.16%	(587)	100%	(598)

Table 2 Cumulative All Observed Regions PFD Use by Gender

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Female	64.21%	(1627)	35.79%	(907)	100%	(2534)	Female	2.29%	(4)	97.71%	(171)	100%	(175)
Male	75.21%	(3871)	24.79%	(1276)	100%	(5147)	Male	1.67%	(7)	98.33%	(411)	100%	(418)
Total	71.58%	(5498)	28.42%	(2183)	100%	(7681)	Total	1.85%	(11)	98.15%	(582)	100%	(593)

Table 3 Cumulative All Observed Regions PFD Use by Craft Type

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Motor Boat	79.06%	(4996)	20.94%	(1323)	100%	(6319)	Jet Ski	1.84%	(11)	98.16%	(588)	100%	(599)
Sailboat	25.23%	(56)	74.77%	(166)	100%	(222)							
Row Boat	59.53%	(178)	40.47%	(121)	100%	(299)							
Canoe	28.35%	(127)	71.65%	(321)	100%	(448)							
Kayak	12.95%	(18)	87.05%	(121)	100%	(139)							
Raft	71.76%	(94)	28.24%	(37)	100%	(131)							
Other/Unk	28.43%	(58)	71.57%	(146)	100%	(204)							
Total	71.21%	(5527)	28.79%	(2235)	100%	(7762)							

Table 4 Cumulative All Observed Regions PFD Use by Region

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Central	54.82%	(1074)	45.18%	(885)	100%	(1959)	Central	0.92%	(1)	99.08%	(108)	100%	(109)
N. Central	81.83%	(1369)	18.17%	(304)	100%	(1673)	N. Central	1.56%	(1)	98.44%	(63)	100%	(64)
East	80.00%	(572)	20.00%	(143)	100%	(715)	East	0.00%	(0)	100.0%	(81)	100%	(81)
West	72.43%	(670)	27.57%	(255)	100%	(925)	West	2.44%	(1)	97.56%	(40)	100%	(41)
Tri-Cities	74.92%	(699)	25.08%	(234)	100%	(933)	Tri-Cities	3.19%	(3)	96.81%	(91)	100%	(94)
Yakima	66.82%	(294)	33.18%	(146)	100%	(440)	Yakima	5.45%	(3)	94.55%	(52)	100%	(55)
Southwest	78.01%	(603)	21.99%	(170)	100%	(773)	Southwest	0.90%	(1)	99.10%	(110)	100%	(111)
Northwest	71.51%	(246)	28.49%	(98)	100%	(344)	Northwest	2.27%	(1)	97.73%	(43)	100%	(44)
Total	71.21%	(5527)	28.79%	(2235)	100%	(7762)	Total	1.84%	(11)	98.16%	(588)	100%	(599)

Table 5 Cumulative Intervention Regions PFD Use by Age

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
<5 Years	4.70%	(7)	95.30%	(142)	100%	(149)	<5 Years	0.00%	(0)	100.0%	(4)	100%	(4)
5-14 Years	24.28%	(314)	75.72%	(979)	100%	(1293)	5-14 Years	0.00%	(0)	100.0%	(51)	100%	(51)
15+ Years	83.08%	(4939)	16.19%	(1006)	100%	(5945)	15+ Years	2.00%	(10)	98.00%	(490)	100%	(500)
Total	71.21%	(5260)	28.79%	(2127)	100%	(7387)	Total	1.80%	(10)	98.20%	(545)	100%	(555)

Table 6 Cumulative Non-Intervention Regions Use by Age

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
<5 Years	0.00%	(0)	100.0%	(5)	100%	(5)	<5 Years						
5-14 Years	41.38%	(24)	58.62%	(34)	100%	(58)	5-14 Years	0.00%	(0)	100.0%	(7)	100%	(7)
15+ Years	79.57%	(222)	20.43%	(57)	100%	(279)	15+ Years	2.78%	(1)	97.22%	(35)	100%	(36)
Total	71.93%	(246)	28.07%	(96)	100%	(342)	Total	2.33%	(1)	97.67%	(42)	100%	(43)

Table 7 Cumulative Intervention Regions PFD Use by Gender

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Female	63.99%	(1548)	36.01%	(871)	100%	(2419)	Female	1.81%	(3)	98.19%	(163)	100%	(166)
Male	75.32%	(3704)	24.68%	(1214)	100%	(4918)	Male	1.83%	(7)	98.17%	(376)	100%	(383)
Total	71.58%	(5252)	28.42%	(2085)	100%	(7337)	Total	1.82%	(10)	98.18%	(539)	100%	(549)

Table 8 Cumulative Non-Intervention Region PFD Use by Gender

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Female	68.70%	(79)	31.30%	(36)	100%	(115)	Female	11.11%	(1)	88.89%	(8)	100%	(9)
Male	72.93%	(167)	27.07%	(62)	100%	(229)	Male	0.00%	(0)	100.0%	(35)	100%	(35)
Total	71.51%	(246)	28.49%	(98)	100%	(344)	Total	2.27%	(1)	97.73%	(43)	100%	(44)

Table 9 Cumulative Intervention Regions PFD Use by Craft Type

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Motor Boat	79.28%	(4780)	20.72%	(1249)	100%	(6029)	Jet Ski	1.80%	(10)	98.20%	(545)	100%	(555)
Sailboat	22.60%	(47)	77.40%	(161)	100%	(208)							
Row Boat	59.64%	(167)	40.36%	(113)	100%	(280)							
Canoe	28.02%	(123)	71.98%	(316)	100%	(439)							
Kayak	11.54%	(15)	88.46%	(115)	100%	(130)							
Raft	71.09%	(91)	28.91%	(37)	100%	(128)							
Other/Unk	28.43%	(58)	71.57%	(146)	100%	(204)							
Total	71.19%	(5281)	28.81%	(2137)	100%	(7418)							

Table 10 Cumulative Non-Intervention Region PFD Use by Craft Type

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Motor Boat	74.48%	(216)	25.52%	(74)	100%	(290)	Jet Ski	2.27%	(1)	97.73%	(43)	100%	(44)
Sailboat	64.29%	(9)	35.71%	(5)	100%	(14)							
Row Boat	57.89%	(11)	42.11%	(8)	100%	(19)							
Canoe	44.44%	(4)	55.56%	(5)	100%	(9)							
Kayak	33.33%	(3)	66.67%	(6)	100%	(9)							
Raft	100.0%	(3)	0.00%	(0)	100%	(3)							
Other/Unk													
Total	71.51%	(246)	28.49%	(98)	100%	(344)							

Table 11 Cumulative Intervention Regions PFD Use by Region

	No PFD		Yes PFD		Total		<i>Personal Watercraft (Jet Ski) Addendum</i>						
							No PFD		Yes PFD		Total		
Central	54.82%	(1074)	45.18%	(885)	100%	(1959)	Central	0.92%	(1)	99.08%	(108)	100%	(109)
N. Central	81.83%	(1369)	18.17%	(304)	100%	(1673)	N. Central	1.56%	(1)	98.44%	(63)	100%	(64)
East	80.00%	(572)	20.00%	(143)	100%	(715)	East	0.00%	(0)	100.0%	(81)	100%	(81)
West	72.43%	(670)	27.57%	(255)	100%	(925)	West	2.44%	(1)	97.56%	(40)	100%	(41)
Tri-Cities	74.92%	(699)	25.08%	(234)	100%	(933)	Tri-Cities	3.19%	(3)	96.81%	(91)	100%	(94)
Yakima	66.82%	(294)	33.18%	(146)	100%	(440)	Yakima	5.45%	(3)	94.55%	(52)	100%	(55)

Southwest	78.01%	(603)	21.99%	(170)	100%	(773)	Southwest	0.90%	(1)	99.10%	(110)	100%	(111)
Total	71.19%	(5281)	28.81%	(2137)	100%	(7418)	Total	1.80%	(10)	98.20%	(545)	100%	(555)

Table 12 Cumulative Non-Intervention Region PFD Use by Region

<i>Personal Watercraft (Jet Ski) Addendum</i>													
No PFD						Yes PFD						Total	
No PFD						Yes PFD						Total	
Northwest	71.51%	(246)	28.49%	(98)	100%	(344)	Northwest	2.27%	(1)	97.73%	(43)	100%	(44)

Table 13 PFD Use Results by Regions

**Central Region
(King County)**

<i>Personal Watercraft (Jet Ski) Addendum</i>													
No PFD						Yes PFD						Total	
No PFD						Yes PFD						Total	
Age							Age						
<5 Years	0.00%	(0)	100.0%	(57)	100%	(57)	<5 Years						
5-14 Years	25.00%	(87)	75.00%	(261)	100%	(348)	5-14 Years	0.00%	(0)	100.0%	(10)	100%	(10)
15+ Years	63.47%	(985)	36.53%	(567)	100%	(1552)	15+ Years	1.01%	(1)	98.99%	(98)	100%	(99)
Total	54.78%	(1072)	45.22%	(885)	100%	(1957)	Total	0.92%	(1)	99.08%	(108)	100%	(109)
Gender							Gender						
Female	50.06%	(401)	49.94%	(400)	100%	(801)	Female	3.70%	(1)	96.30%	(26)	100%	(27)
Male	58.10%	(671)	41.90%	(484)	100%	(1155)	Male	0.00%	(0)	100.0%	(82)	100%	(82)
Total	54.81%	(1072)	45.19%	(884)	100%	(1956)	Total	0.92%	(1)	99.08%	(108)	100%	(109)
Craft Type							Craft Type						
Motor Boat	81.15%	(900)	18.85%	(209)	100%	(1109)	Jet Ski	0.92%	(1)	99.08%	(108)	100%	(109)
Sailboat	16.04%	(30)	83.96%	(157)	100%	(187)							
Row Boat	27.87%	(17)	72.13%	(44)	100%	(61)							
Canoe	22.94%	(78)	77.06%	(262)	100%	(340)							
Kayak	8.08%	(8)	91.92%	(91)	100%	(99)							
Raft													
Other/Unk	25.15%	(41)	74.85%	(122)	100%	(163)							
Total	54.82%	(1074)	45.18%	(885)	100%	(1959)							

**North Central Region
(Grant County)**

<i>Personal Watercraft (Jet Ski) Addendum</i>													
No PFD						Yes PFD						Total	
No PFD						Yes PFD						Total	
Age							Age						
<5 Years	4.55%	(1)	95.45%	(21)	100%	(22)	<5 Years						
5-14 Years	26.83%	(66)	73.17%	(180)	100%	(246)	5-14 Years	0.00%	(0)	100.0%	(5)	100%	(5)
15+ Years	92.67%	(1302)	7.33%	(103)	100%	(1405)	15+ Years	1.69%	(1)	98.31%	(58)	100%	(59)
Total	81.83%	(1369)	18.17%	(304)	100%	(1673)	Total	1.56%	(1)	98.44%	(63)	100%	(64)
Gender							Gender						
Female	70.03%	(278)	29.97%	(119)	100%	(397)	Female	0.00%	(0)	100.0%	(9)	100%	(9)
Male	85.80%	(1088)	14.20%	(180)	100%	(1268)	Male	1.85%	(1)	98.15%	(53)	100%	(54)
Total	82.04%	(1366)	17.96%	(299)	100%	(1665)	Total	1.59%	(1)	98.41%	(62)	100%	(63)
Craft Type							Craft Type						
Motor Boat	83.18%	(1271)	16.82%	(257)	100%	(1528)	Jet Ski	1.56%	(1)	98.44%	(63)	100%	(64)

Sailboat	100.0%	(4)	0.00%	(0)	100%	(4)
Row Boat	73.33%	(66)	26.67%	(24)	100%	(90)
Canoe	37.50%	(3)	62.50%	(5)	100%	(8)
Kayak	0.00%	(0)	100.0%	(2)	100%	(2)
Raft	70.00%	(21)	30.00%	(9)	100%	(30)
Other/Unk	36.36%	(4)	63.64%	(7)	100%	(11)
Total	81.83%	(1369)	18.17%	(304)	100%	(1673)

Table 13 PFD Use Results by Intervention Regions (Continued)

East Region

(Asotin, Spokane, and Stevens Counties)

Personal Watercraft (Jet Ski) Addendum

						Personal Watercraft (Jet Ski) Addendum							
						No PFD		Yes PFD		Total			
Age						Age							
<5 Years	16.67%	(2)	83.33%	(10)	100%	(12)	<5 Years	0.00%	(0)	100.0%	(6)	100%	(6)
5–14 Years	35.21%	(50)	64.79%	(92)	100%	(142)	5-14 Years	0.00%	(0)	100.0%	(75)	100%	(75)
15+ Years	93.60%	(512)	6.40%	(35)	100%	(547)	15+ Years	0.00%	(0)	100.0%	(81)	100%	(81)
Total	80.46%	(564)	19.54%	(137)	100%	(701)	Total	0.00%	(0)	100.0%	(81)	100%	(81)
Gender						Gender							
Female	79.58%	(226)	20.42%	(58)	100%	(284)	Female	0.00%	(0)	100.0%	(33)	100%	(33)
Male	82.56%	(336)	17.44%	(71)	100%	(407)	Male	0.00%	(0)	100.0%	(46)	100%	(46)
Total	81.33%	(562)	18.67%	(129)	100%	(691)	Total	0.00%	(0)	100.0%	(79)	100%	(79)
Craft Type						Craft Type							
Motor Boat	80.26%	(561)	19.74%	(138)	100%	(699)	Jet Ski	0.00%	(0)	100.0%	(81)	100%	(81)
Sailboat	66.67%	(2)	33.33%	(1)	100%	(3)							
Row Boat	57.14%	(4)	42.86%	(3)	100%	(7)							
Canoe													
Kayak	0.00%	(0)	100.0%	(1)	100%	(1)							
Raft	100.0%	(5)	0.00%	(0)	100%	(5)							
Other/Unk													
Total	80.00%	(572)	20.00%	(143)	100%	(715)							

West Region

(Pierce, Thurston, and Lewis Counties)

Personal Watercraft (Jet Ski) Addendum

						Personal Watercraft (Jet Ski) Addendum							
						No PFD		Yes PFD		Total			
Age						Age							
<5 Years	0.00%	(0)	100.0%	(9)	100%	(9)	<5 Years	0.00%	(0)	100.0%	(2)	100%	(2)
5– 4 Years	8.97%	(13)	91.03%	(132)	100%	(145)	5-14 Years	0.00%	(0)	97.44%	(38)	100%	(39)
15+ Years	85.21%	(657)	14.79%	(114)	100%	(771)	15+ Years	2.44%	(1)	97.56%	(40)	100%	(41)
Total	72.43%	(670)	27.57%	(255)	100%	(925)	Total	2.44%	(1)	97.56%	(40)	100%	(41)
Gender						Gender							
Female	62.93%	(129)	37.07%	(76)	100%	(205)	Female	0.00%	(0)	100.0%	(9)	100%	(9)
Male	75.14%	(541)	24.86%	(179)	100%	(720)	Male	3.12%	(1)	96.88%	(31)	100%	(32)
Total	72.43%	(670)	27.57%	(255)	100%	(925)	Total	2.44%	(1)	97.56%	(40)	100%	(41)
Craft Type						Craft Type							
Motor Boat	77.26%	(615)	22.74%	(181)	100%	(796)	Jet Ski	2.44%	(1)	97.56%	(40)	100%	(41)

Sailboat	100.0%	(4)	0.00%	(0)	100%	(4)
Row Boat	65.22%	(30)	34.78%	(16)	100%	(46)
Canoe	25.00%	(11)	75.00%	(33)	100%	(44)
Kayak	25.00%	(1)	75.00%	(3)	100%	(4)
Raft	39.13%	(9)	60.87%	(14)	100%	(23)
Other/Unk	0.00%	(0)	100.0%	(8)	100%	(8)
Total	72.43%	(670)	27.57%	(255)	100%	(925)

Table 13 PFD Use Results by Intervention Regions (Continued)

**South Central Region - Tri-Cities
(Benton, Walla Walla, and Franklin Counties)**

						<i>Personal Watercraft (Jet Ski) Addendum</i>							
No PFD			Yes PFD			Total	No PFD			Yes PFD			Total
Age						Age							
<5 Years	9.09%	(2)	90.91%	(20)	100%	(22)	<5 Years	0.00%	(0)	100.0%	(3)	100%	(3)
5-14 Years	20.22%	(37)	79.78%	(146)	100%	(183)	5-14 Years	0.00%	(0)	100.0%	(11)	100%	(11)
15+ Years	90.91%	(650)	9.09%	(65)	100%	(715)	15+ Years	3.75%	(3)	96.25%	(77)	100%	(80)
Total	74.89%	(689)	25.11%	(231)	100%	(920)	Total	3.19%	(3)	96.81%	(91)	100%	(94)
Gender						Gender							
Female	71.47%	(243)	28.53%	(97)	100%	(340)	Female	5.56%	(2)	94.44%	(34)	100%	(36)
Male	78.97%	(443)	21.03%	(118)	100%	(561)	Male	1.79%	(1)	98.21%	(55)	100%	(56)
Total	76.14%	(686)	23.86%	(215)	100%	(901)	Total	3.26%	(3)	96.74%	(89)	100%	(92)
Craft Type						Craft Type							
Motor Boat	75.05%	(683)	24.95%	(227)	100%	(910)	Jet Ski	3.19%	(3)	96.81%	(91)	100%	(94)
Sailboat													
Row Boat													
Canoe	87.50%	(14)	12.50%	(2)	100%	(16)							
Kayak	28.57%	(2)	71.43%	(5)	100%	(7)							
Raft													
Other/Unk													
Total	74.92%	(699)	25.08%	(234)	100%	(933)							

**South Central Region – Yakima
(Yakima and Kittitas Counties)**

						<i>Personal Watercraft (Jet Ski) Addendum</i>							
No PFD			Yes PFD			Total	No PFD			Yes PFD			Total
Age						Age							
<5 Years	0.00%	(0)	100.0%	(9)	100%	(9)	<5 Years	0.00%	(0)	100.0%	(1)	100%	(1)
5-14 Years	27.18%	(28)	72.82%	(75)	100%	(103)	5-14 Years	0.00%	(0)	100.0%	(4)	100%	(4)
15+ Years	81.35%	(266)	18.65%	(61)	100%	(327)	15+ Years	6.00%	(3)	94.00%	(47)	100%	(50)
Total	66.97%	(294)	33.03%	(145)	100%	(439)	Total	5.45%	(3)	94.55%	(52)	100%	(55)
Gender						Gender							
Female	61.24%	(79)	38.76%	(50)	100%	(129)	Female	0.00%	(0)	100.0%	(15)	100%	(15)
Male	70.72%	(215)	29.28%	(89)	100%	(304)	Male	7.50%	(3)	92.50%	(37)	100%	(40)
Total	67.90%	(294)	32.10%	(139)	100%	(433)	Total	5.45%	(3)	94.55%	(52)	100%	(55)
Craft Type						Craft Type							
Motor Boat	67.40%	(184)	32.60%	(89)	100%	(273)	Jet Ski	5.45%	(3)	94.55%	(52)	100%	(55)

Canoe	44.44%	(4)	55.56%	(5)	100%	(9)
Kayak	33.33%	(3)	66.67%	(6)	100%	(9)
Raft	100.0%	(3)	0.00%	(0)	100%	(3)
Other/Unk						
Total	71.51%	(246)	28.49%	(98)	100%	(344)

Discussion

Overall PFD use by occupants of small boats in Washington remained low at 29% (Table 4). However, use rates by children were high, at 100% for many regions in the <5 year old category (Table 13). A shift of attitude appeared in the age group 5-14 years, with PFD use averaging 75% (Table 1), and ranging from 91% in Central Region to 59% in Northwest Region (Table 14). Washington state law now requires that PFDs be worn by children 12 years old and younger in boats under 19 feet.⁴ For those in the 15 and older age category, use rates were 17% overall (Table 1). For adolescents and young adults (as well as adults of all ages) there remains a need to change PFD use regardless of what age limitations are present in existing state law.

Males were less likely to wear PFDs, with 25% use compared to 35% for females (Table 2). Also significant is the high usage of PFDs by kayak occupants (87%) compared to the lowest use rate by motor boat occupants (21%) (Table 3). Further study to gain insight as to factors affecting such differing attitudes warrants consideration. Results of such a study could then be utilized to refine educational efforts toward the lowest PFD usage categories.

For jet skiers the overall PFD use rate was found to be 98% for all categories (Tables 1-4). PFD use for jet skiers in all regions was found to be at least 95%, with 100% usage in many regions. (Table 13). This level of compliance with prevention-oriented state law is consistent with other studies of compliance such as with mandatory universal motorcycle helmet laws. In states where universal helmet laws have been enacted, 92% to 100% helmet use results.⁵ Consideration must be made of the effectiveness of legislation which mandates prevention behavior, and use of safety devices (i.e. PFDs).

Factors that may have influenced the observation results include recent changes in federal and Washington recreational boating laws. Recent laws that have been enacted include the passage of stricter requirements for wearable PFDs for each occupant in the boat (May 1995), as well as requirements for children 12 and under to wear PFDs (July 1999).^{4 6} These influences can reasonably be seen as directly affecting the availability and usage of PFDs.

A second potentially complicating influence is the recent development of and United States Coast Guard (USCG) approval of less visible PFDs. Fashionable, more comfortable PFDs such as float coats (USCG Type III) and trim vests for water sports, are not always readily obvious. Special suits (USCG Type V) may also be indistinguishable as PFDs. With the recent U.S. Coast Guard approval of inflatable suspender-type and pouch type PFDs, these devices have become available as a PFD option.⁷ Such PFDs are easily disguised and difficult to distinguish from a distance, and this could negatively affect a count.

Additionally, the potential for influence from PFD use policy comes into question. Some of the observation sites are near organized water sports outlets (i.e. facility equipment loan or resort areas).

Requirements in rental or loan of equipment that call for PFDs to be worn when using boats could potentially affect results. Complicating a potential analysis of this influence may be location and containment of boat users within range of the local policy-affected sites.

Conclusion

There is still much to be done to increase PFD use in the state of Washington. Continued efforts in the promotion of PFD use are essential. A refinement of educational focus toward low use entities and categories is important. Understanding and gaining the essentials to modify boater attitude may necessitate additional investigation. It appears that laws and policies do have some impact on use. However, prevention efforts must continue to be multi-faceted with targeted education, better availability, accessibility and acceptability of PFDs and their use, as well as potential legislation with appropriate enforcement.

References

- 1 Children's Hospital & Regional Medical Center, *Washington State Drowning Prevention Project*. <http://www.chmc.org/DP>.
- 2 Quan L, Bennett E, Cummings P, et al. Are life vests worn? A multiregional observational study of personal flotation device use in small boats. *Injury Prevention* 1998;4:203-205.
- 3 Operation of personal watercraft--Prohibited activities--Penalties, RCW 79A.60.190 § 1 (2000) (formerly RCW 88.12.145).
- 4 Personal flotation devices required--Penalty, RCW 79A.60.160 § 4 (2000) (formerly RCW 88.12.115).
- 5 National Highway Traffic Safety Administration. *Nearly 100 Percent of Motorcyclists Comply with Universal Helmet Laws*. <http://www.nhtsa.dot.gov/people/injury/pedbimot/safebik/helmet.html>.
- 6 Personal flotation devices required--Penalty, RCW 79A.60.160 § 1 (2000) (formerly RCW 88.12.115).
- 7 U.S. Coast Guard Regulation CFR 33, Chapter 1 § 175 (1999).

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