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Personal Watercraft: Safety and Environmental Impact

Of the 13 million registered watercraft in the United States, 1 million are personal watercraft (PWC) or jet-skis. While they make up a small percentage of all boats, they contribute to 36 percent of boating accidents (Wood 1998). "For the most part we have found that people use the craft responsibly, what gives them a bad name is the number of people who show off by irritating other boaters, fisherman, and beach users," says Bud Inman, spokesman for Lake Mead National Recreation Area (Wood 1998). Because of PWCs popularity among users, and the large population of people opposed to their use, the issue of banning PWC use has fueled controversy, national attention, and lawsuits.

Arguments Supporting a PWC Ban

Accidents:

Personal watercrafts have high accident and fatality rates. As noted earlier, PWCs are involved in 35 percent of all accidents with water vessels. The number of accidents and fatalities due to PWC use has been increasing consistently with each year since 1987 (see Table 1).

Pollution:

Widespread PWC use has a significant impact on the environment due to the two stroke engines which leak millions of gallons of unburned fuel into the waters each year (Pearce, 1998). Scientists estimate that 20 to 25 percent of the fuel used in personal watercraft and other watercraft with two stroke engines fail to combust, and is flushed out into the water as raw fuel vapor emissions (Pearce, 1998).

To illustrate the level of pollution, in Michigan, the 82,000 registered watercraft, if each rider expends a full 10-gallon tank, will expend more than 200,000 gallons of fuel into the water. If a watercraft carries four gallons of gas, than approximately one gallon will be directly leaked into the water (Pearce, 1998). Two hours of exhaust emissions from a Jet Ski is equivalent to the emissions created by driving a 1998 automobile 130,000 miles (Stienstra, 1998).

Biological Impact: The pollution emitted from PWCs have a considerable impact on wildlife. When the unburned fuel is released into the water, tiny organisms absorb the chemicals and become extremely sensitive to light, an occurrence called phototoxicity. The Daylight sun then kills the organism, which causes a collapse of the food chain as food sources slowly become eliminated (Pearce, 1998).

Arguments Opposing a PWC Ban

Rights

Manufacturers and PWC users opposing the ban say that it is arbitrary and unnecessary. They say that newer models are cleaner and quieter, and users are becoming more courteous and safe (Stienstra, 1998). They argue that every boat pollutes, and that it is unfair to single out PWCs. Some who oppose the ban claim that it is an unlawful taking of private property and violates equal protection guarantees under the Constitution (Sward & Doyle, 1997).

Accident Numbers

According to John Donaldson, executive director of the Personal Watercraft Association, the portrayal of personal watercraft as dangerous is unfair. The accident and injury rates of personal watercraft are based on the number of PWCs in use. A more meaningful and accurate measure, according to Donaldson, would be computing these rates based on hours of operation (Fauber, 1998).

Table 2 presents a comparison of accident rates for various watercrafts. In terms of raw numbers, personal watercrafts are involved in more injuries than other boating vessels. However, these high injury rates need to be understood in relation to the greater number of PWCs in use. By looking at the injury and fatality rates as a function of the number of vessels, it seems that these rates are not outstanding compared to other vessels. Canoe/Kayak, open motor boats, and rowboats have only slightly lower injury rates. Canoes and rowboats all have a much higher fatality rates per vessel.

Improved PWC Engines

Bombardier, a manufacturer of personal watercraft, says that all models of the Sea Doo watercraft will be modified by this model year, 1999. They will have the D-Sea-Bel Noise Reduction System, which uses sound reduction technology to lower noise emissions. Test results showed that the Sound Pressure Level on the new GTX RFI is 50% lower than the 1997 GTX model. The GTX RFI also features a Rotax Fuel Injection system, designed to reduce the hydrocarbon exhaust by more than 25%, and improves fuel economy by 15%. (Business Wire, 1997).

In addition, future technology may soon allow for four stroke engines to replace the current two stroke engines in use. Technology today does not permit the four stroke engines in PWCs, because they make the vessels less reliable in rough water. Four stroke engines burn only fuel, in contrast to two stroke engines which use oil and fuel, so emissions are considerably cleaner (Pearce, 1998).

National Action

The National Parks are concerned with the disproportionately high amount of pollution they put into the water. The two-cycle engines employed on personal watercraft have the largest percent of unburned fuel passing through the engine and into the water. For MTBE (methyl tertiary butyl ether), the two-cycle outboard engines were the least efficient. Over 30 percent of the MTBE initially contained in the watercraft's fuel tank was deposited into the water during operation. The results for benzene and toluene were similar (Tahoe Regional Planning Agency 1999).

These fuel additives as well as the benzene and other carcinogens that are deposited into the water by PWC's are responsible for killing plankton and severely polluting the blue waters of Lake Tahoe, on the California-Nevada border. While the Tahoe Regional Planning Agency originally wanted to ban the jet skis for their loud noise, it was the extremely high levels of pollution that the two-cycle engines generate that led to the Agencies ban on the watercraft. Effective June 1st, most personal watercraft will no longer be allowed on Lake Tahoe unless they meet certain guidelines such as meeting clean air act emissions limits that take effect in 2006, or if they have direct fuel injection, which already meet the 2006 standards. Also exempted through Oct. 1, 2001 are engines with less than 10 horsepower, engines with electronic fuel injection, rotax fuel injection engines, and any engine that meets the weaker 2001 air quality standards (Lucas 1999)

The National Park Service by May of 1999 announced that personal watercraft will be banned in 62 of its parks and will be allowed in the remaining 25. The NPS maintains control of only 10% of all water areas in the US

(Wood 1998). Before arriving at their decision, the NPS held a two month long public comment period about the use of personal watercraft. Results show that 75% of the 60,000 respondents were opposed to the watercraft (USA Today 1999). Spokesman for Olympic National Park Barb Maynes claims that, "when we opened public comment to this issue we were frankly concerned about the level of concern, most people don't want to come to the wilderness to be assaulted by the same sounds and sights they left behind" (Wood 1998)

State Action

Three states require an adult to be on board when a minor is operating a PWC. Sixteen states have specific speed limitations (USPS 1997).

Florida

Known for its fishing and boating, Florida is a state that thrives on its waterways. However, like many states it is concerned with the issue of personal watercrafts on its lakes and oceans. According to the Florida Marine Patrol, personal watercraft make up only about 10 percent of all boats on the water yet are involved in 30 percent of all boating accidents resulting in injuries (Sergeant 1998). Florida has laws on the books regarding boating but with a heavy workload and small staffs it became difficult to enforce the laws. However with the increase in accidents with these jet-skis, officers doubled the amount of citations given in 1998 from 1997 (Saunders 1998). "We're turning up the heat...we lead the nation in total number of accidents, injuries and death in personal watercraft," says Capt. Maurice V. Radford of the Florida Marine Patrol. Currently, only those above age 14 can operate personal watercraft and 16 to rent.

Michigan

Michigan State passed a Personal Watercraft Safety Act during the 1997-1998 session. Although Michigan experiences negative environmental effects from the pollution emitted from PWC's, the bill only addresses the issues surrounding safety. The bill requires Jet Skiers to stay 200 feet from shorelines, establishes a safety program prerequisite to train riders in safety, and prohibits adolescents from operating a PWC without certification. Passing of this bill was difficult, according to the bill's sponsor, Senator Jon Cisky (R-Saginaw). According to the senator, the bill took almost two years to get agreement. "Getting these bills through was a hell of a lot more difficult than we ever thought it would be," said the senator in an interview. The absence of pollution and noise provisions, according to the senator, is the result of a long and difficult compromise process. Noise and pollution provisions originally included were dropped, but efforts continue to bring the bill in this direction (Pearce, 1998).

Maine

In Maine, the Great Pond Task Force Legislation has taken action to restrict the use of PWC's on Maine waters. The Legislature enacted an amended version of LD 1730. Public Law 1997, chapter 739, took effect on July 9, 1998. A brief summary of regulations is listed below:

- PWCs are prohibited on remote and undeveloped ponds having at least one outstanding resource value that are wholly or partly within the jurisdiction of the Main Land Use Regulation Commission (LURC). LURC must adopt rules to implement this provision.
- PWCs prohibited on waters where more than two thirds lies in LURC's jurisdiction and more than half of the shoreline is in conservation ownership for low impact public recreation. Requires operators to be of at least 16 years of age

Requires rental and leasing agents to provide each renter/leaser with written instructions on proper operation of watercraft.

- Prohibits internal combustion motors on five ponds on Mount Desert Island that are entirely within Acacia National Park and prohibits motors greater than 10 horsepower on two other great ponds wholly within the

Park

- Imposes civil penalties for operation PWC in excess of certain noise limits and tampering with motorboat muffler systems

In addition, state regulators are considering prohibition of all motorized boat traffic on some remote lakes, as well as some Maine rivers. The draft legislation calls for changing the focus of restrictions from type of vessel to horsepower. Included in the proposed expanded ban and horsepower limitations are selected lakes within public lands, including some state parks (Associated Press, 1998)

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Table 1

U.S. COAST GUARD PWC ACCIDENT STATISTICS: 1987 - 1996					
YEAR	PWC SALES*	PWC IN USE**	PWC IN ACCIDENTS	PWC INJURIES	PWC FATALITIES
1987	29,000	92,756	376	156	5
1988	48,000	126,881	650	254	20
1989	64,000	178,510	844	402	20
1990	72,000	241,376	1,162	532	28
1991	68,000	305,915	1,513	708	26
1992	79,000	372,283	1,650	730	34
1993	107,000	454,545	2,236	915	35
1994	142,000	600,000	3,002	1,338	56
1995	200,000	760,000	4,028	1,631	68
1996	191,000	900,000	4,091	1,831	57
TOTALS:			19,552	8,497	349
*Estimates from the National Marine Manufacturers Association					
**Estimates from the Personal Watercraft Industry Association					

Table 2

Recreational Boating Accident Statistics: Boat Types - 1996					
Type of Boat	#Vessels	#Injuries	#Fatalities	Injury Rate/Vessel	Fatality Rate/Vessel
Auxiliary Sail	336	49	7	14.6%	2.1%
Cabin Motorboat	1,365	374	38	27.4%	2.8%
Canoe/Kayak	145	60	64	41.4%	44.1%
Houseboat	133	14	3	10.5%	2.3%
Open Motorboat	4,012	1,754	386	43.7%	9.6%
Other	195	92	30	47.2%	15.4%
Personal Watercraft	4,091	1,831	57	44.8%	1.4%
Pontoon	171	48	15	28.1%	8.8%
Rowboat	73	28	42	38.4%	57.5%
Sail (only)	120	33	10	27.5%	8.3%
Unknown	628	135	49	21.5%	7.8%
Totals:	11,285	4,427	709	39.2%	6.3%

Source: U.S. Coast Guard