

**Flathead Lakers**  
**Personal Watercraft Project**  
**PWC Task Force Report to the Board of Directors**  
**April 12, 2001**

***The Problem***

Personal Watercraft (PWC, commonly known as jet skis) are having negative impacts on Flathead Lake and other lakes and rivers in the Flathead Watershed. They also negatively impact many lakeshore residents, visitors and other water recreators. These impacts include noise, water and air pollution, dangerous and disrespectful operator behavior, and wildlife disruptions.

***Background***

Due to numerous requests and complaints, the Flathead Lakers Board of Directors decided to determine whether there was sufficient concern among Lakers members about the impacts of PWC to warrant action. An article about PWC impacts appeared in the summer, 2000 newsletter along with a questionnaire. There was a 15% response to the questionnaire, with 96% of respondents indicating the Flathead Lakers should take action to help reduce negative impacts of PWC. The board decided to establish a task force to investigate PWC impacts, regulations, enforcement and options for reducing impacts. Board member Rose Schwennesen agreed to co-chair the task force. The task force first met on January 29, 2001. At that meeting three committees were formed. The task force again met on March 19 at which reports on the research and recommendations of each committee were heard and discussed and recommendations to the Board of Directors for action were agreed on.

***PWC Numbers***

The Department of Motor Vehicles in Deer Lodge reported that as of January 8, 2000 there were 5,131 PWCs registered in Montana. There were 955 that were four years old and newer, and there were 4,176 that were older than four years. They are not registered by county. This does not include the many PWCs which are brought into the state at vacation time.

***Pollution & Environmental Impacts***

**Two-stroke engines:**

Most outboard and all PWC engines are currently powered with two-stroke technology. Non-fuel injected, carbureted two stroke engines emit an average of 25% of their gas/oil mixture directly, unburned, into the water or air.<sup>1</sup> Hydrocarbons can cause chromosomal damage, reduced growth and mortality in fish at low levels. Among gasoline's harmful constituents are carcinogenic benzene and toluene, and xylene.<sup>2</sup>

**EPA Regulations:**

Because of the high emission rates of traditional two-stroke engines, the EPA adopted new emission standards in 1996 that are being phased in over a nine year period from 1998 to 2006. These standards do not apply to any engine sold before 1998. By 2006, each manufacturer must meet a hydrocarbon (HC) emission standard on a corporate average basis that represents a 75% reduction in HC compared to unregulated levels. EPA expects a 50% reduction in HC emissions from marine engines by 2020 and a 75% reduction by 2025 as old engines are replaced by new ones. The technology used to meet the standards is left up to the manufacturers.<sup>3</sup> California is requiring stricter standards that are implemented quicker: a 70% reduction in emissions for new models by 2001, an additional 20% reduction by 2004, and an additional 65% reduction by 2008. The California Air Resources Board estimates the reduction by 2010 will be 32% greater than the EPA standards require.<sup>4</sup>

**Direct fuel-injected two-stroke engines:**

In newer, direct fuel-injected two-stroke engines, pressurized fuel vapor is introduced directly into the combustion chamber, greatly reducing the amount of unburned fuel. The marine industry began producing PWC with this type of engine in 1999, some of which meet the EPA's 2006 standard.<sup>5</sup> Manufacturers say this technology also reduces noise.

**Four-stroke engines:**

In four-stroke engines, which are used in automobiles, the four strokes of the piston are the intake, compression, power and exhaust strokes. They produce significantly less (90-97%) HC emissions. However, they are bigger and heavier for the same amount of power as a two-stroke, and have a much lower tolerance for water ingestion, which causes problems in a PWC which can be turned upside down.<sup>6</sup> Noise from four-strokes is also less than for two-stroke engines.

**MTBE:**

This compound is added to gasoline as an oxygenator to reduce air quality emissions in some areas. However, it may also be added as an octane booster. MTBE has contaminated water supplies in some areas (primarily groundwater has been studied). It is a suspected human carcinogen. We were unable to conclusively determine whether MTBE is currently used as an additive to gasoline locally. Christine Knutson of the Montana EPA said it is added by distributors and gas stations can change distributors at any time. Since there are currently no regulations against adding MTBE, no reporting is required. Calls to distributors did not yield reliable information. On February 14, 2001 Representatives Greg Ganske (R-IA) and John Shimkus (R-IL) introduced legislation, H.R. 608, to ban MTBE in three years.<sup>7</sup>

**Noise:**

Noise is the problem most easily recognized with PWC. Loudness is measured in decibels (dB), a logarithmic scale which means that every 10dB represents a tenfold increase in loudness. The range of frequencies to which humans respond is called the "A" scale and readings in this range are recorded as dBA. A very quiet evening at the lake is about 40 dBA. Background levels on a beach or other busy area are about 50-60 dBA. Typical PWC are about 80-100 dBA. Sound levels in excess of 75dBA become annoying to many people and are termed "noisy." Constant exposure to sound at 75 dBA can cause damage to the auditory system. The American Hospital Assoc. recommends hearing protection when exposed to sound levels over 85dBA on more than an occasional basis. A constant sound is perceived as less disturbing than an intermittent, varying sound at a lower level.<sup>8</sup>

PWC engine noise is usually muffled by the water. When out of the water, the noise level increases by 15 dBA and also changes in pitch. When the machine re-enters the water it makes a smack or whomp. A varying noise like this commands the hearer's continuous attention, making it especially bothersome.<sup>9</sup>

**Wildlife Impacts:**

There is research from other places showing boats and especially PWCs have negative impacts on nesting waterfowl. According to Gael Bissel, MT DFW&P, Flathead Lake isn't used much for nesting sites, but it is a brooding area. Apparently no research has been done locally on the impacts on wildlife. Lynn Kelly, a teacher in Polson who has done extensive research on loons, reported that PWC have had an impact on the successful nesting of loons on Seeley, Inez and Alva lakes. Loons alert and leave their nests when boats disturb them. She said a PWC causes loons to alert at triple the distance as a regular motorboat. She said she hears many anecdotal reports of PWC operators harrassing waterfowl.

## ***Legal Issues***

### **Summary of Relevant Current Montana Regulations:**

- The 1999 Legislature passed House Bill 626 which amended 8-1-303(2)MCA. among other restrictions, HB 626 gave the Fish, Wildlife & Parks Commission authority to regulate, through the Administrative Rule process “public welfare” and “the resolution of conflicts between users of motorized and nonmotorized boats.”
- At idle speed, exhaust noise may not be in excess of 90 dBA measured one meter from the muffler. On Flathead Lake, Echo Lake and Swan Lake a person may not operate a boat or PWC in proximity to the shoreline if the noise emitted is greater than 75 dBA measured at shoreline.
- Children 12 years old or younger may not operate a boat or personal watercraft over 10 hp unless accompanied by someone 18 years or older.
- Children 13 to 14 years old must have a motor boat operator’s certificate to operate a craft over 10 hp or have an 18-year-old present.
- A person 15 years of age or older may operate any craft.
- A person must be at least 18 years old to rent a craft greater than 10 hp.
- A no-wake speed must be maintained when within 200 feet of a dock, swimmer, swimming raft, non-motorized boat or anchored vessel.
- All motorized watercraft must remain more than 100 yards from a vessel or skier while crossing a wake.
- A no-wake speed must be maintained within 200 feet of the shoreline of all lakes. (*adopted in 2000*)
- A no-wake speed must be maintained on lakes 35 acres or less in size. (*adopted in 2000*)
- Boats must remain at least 75 feet from a person engaged in fishing or hunting waterfowl (unless unavoidable then must travel at no-wake or minimum speed).
- Boats must remain at least 50 feet from a swimmer except for boats towing waterskiers.
- A person convicted of violating Montana’s boating laws or regulations may be fined up to \$500 and sentenced for up to six months in jail. <sup>10</sup>

### **Enforcement:**

Grant Holle of the Lake County Sheriff’s office reported that the 75 dBA limit on Flathead Lake cannot be accurately measured due to ambient noise, so it is not enforced. All PWC checked for the 90dBA idling limit pass. There are three enforcement boats that are used on the lake, one each from Flathead County, Lake County and the MT Dept. of Fish, Wildlife & Parks. Grant Holle believes the biggest offenders of the 200 feet no-wake zone are PWC renters. He says they run nonstop, most don’t know the laws, and many don’t know how to operate the machines very well.

The Lake County Sheriff reported that a boat was donated by an anonymous individual to be used for enforcement and rescue on Flathead Lake. In the past, Lake Co. also received a \$10,000 donation which the Coast Guard would match to pay for staff time from the Sheriff’s Dept. for enforcement. The \$10,000 has apparently been spent for other purposes and additional funds from this source are not available. There are more demands on the Sheriff’s Dept. than can be met, and they do not have funds to hire additional personnel. The boat was not used last year as no operational funds were available. The county may be liable if they don’t respond to emergencies. In 1998 Lake Co. received 124 calls for boating incidents, in 1999 they received 62 calls (using a different categorization system), and in 2000 they received 83 calls.

The Lake County Commissioners would be willing to consider setting aside an amount equal to the fine amounts disbursed to the county to be included in the Sheriff’s enforcement budget. The Lake County Sheriff would be willing to conduct a workshop with the Flathead Lakers to show how citizens could be more effective in assisting the deputies.

## Legislation:

SB 492 was introduced in the 2001 Montana Legislature. It would increase the boat decal fee from \$2.50 to \$5.00, with the additional funds to be used for safety education and enforcement of boating rules. According to testimony from the Dept. of Fish, Wildlife & Parks in support of the bill, "This funding will be used to provide for 12 seasonal boat safety officers across the state. These individuals will do boater training, ethics education, water safety checks and where needed, water related law enforcement." The Flathead Lakers supported this bill. It passed the Senate by a vote of 36 to 12. There was a hearing on the bill in the House Fish, Wildlife & Parks Committee on March 20. We understand the bill did not make it out of committee, due to opposition by outfitters who may have been confused about what it would do. There may be an attempt to revive the bill.

## Regulations in Other Places:

Number of states relating to PWCs that:

Require PFDs	all
Set minimum boating age	47
Prohibit PWCs at night	49
Limit wake-jumping	42
Require an adult on board with minor	32
Prohibit operation in specific areas	28
Set speed limits	12

## Other specific regulations (not comprehensive):

Washington: PWCs have a 300-foot no wake zone from shore or a stationary vessel.

Mandatory education school after one water safety violation.

Oregon: 200-foot no-wake zone for all vessels from dock or landing. PWCs banned from any inland river.

New York: Require all boat operators to be licensed. PWC must remain 500 feet from any swimming area.

Idaho: Cannot wake jump within 100 feet of vessel making the wake.

Mass. & NH: Prohibits PWCs on lakes less than 75 acres.

Vermont: Prohibits PWCs on most lakes less than 300 acres.

Minnesota: Unlawful to chase or harrass wildlife.<sup>11</sup>

Lake Tahoe Region: Effective June 1, 1999: Most carbureted two-stroke engines banned: Engines allowed include direct fuel injection two-stroke engines, two-stroke engines that meet the California Air Resources Board 2001 or the U.S. EPA 2006 emissions standard, four-stroke engines. Until October 1, 2001 auxiliary sailboat engines, carbureted two-stroke engines 10 hp or less, electronic fuel injection or Rotax fuel injection two-stroke engines, and any engines that meet the U.S. EPA 2001 emissions standard are allowed. They will no longer be allowed after October 1, 2001. TRPA (Tahoe Regional Planning Agency) also adopted an ordinance that establishes a 600-foot no wake zone around Lake Tahoe to minimize noise impacts.<sup>12</sup>

San Juan County, Washington: August, 1998: The Washington State Supreme Court approved San Juan County's prohibition on the use of jetskis in County waters for two years. For the first time in the nation, a state supreme court upheld the right of a county to adopt such a ban.<sup>13</sup>

Hawaii: 1993: State Supreme Court upheld a statute banning commercial operation of PWCs on certain bays during weekends and holidays while permitting recreational use of conventional watercraft on these same bays to remain unrestricted (to reduce safety & environmental impacts).<sup>14</sup>

### Other options for regulations:

- Restricted hours of use for boats or specifically PWCs (Savage Lake in Lincoln Co., MT currently has a no-wake requirement between the hours of 5 am and 10 am and between 7 pm and 11 pm each day.
- Restricted days of use (108-acre Great Pond in Eastham on Cape Cod allows motorized watercraft to operate only on even-numbered days).<sup>15</sup>
- Additional restrictions for persons renting motorized watercraft.
- Required education course on regulations, operations, safety.
- Licensing of operators.
- Restricted areas (allowing only certain uses in certain areas of the lake)
- Buoys marking no-wake zone

## ***Education & Safety***

### **Safety:**

A good effort was put forth by the PWC Task Force to find numbers of accidents and other safety problems encountered with PWC. No reliable data was found even after contacting QRUs, fire departments, law enforcement agencies and hospitals. The only information that could be obtained was from the Montana State Trauma Registry (Pam LaFontaine). That information showed only one boating trauma accident reported for the western section of the state in 1999 and 3 in 1998.

National Transportation Safety Board figures from 1998 based on data from the Coast Guard found that nationally PWC used in 1996 were only 7.5% of state-registered recreation boats, yet they accounted for 36% of the reported recreational boating accidents and more than 41% of the persons injured. In addition, although the number of recreational boating fatalities has declined, the number of PWC fatalities increased over 200%.<sup>16</sup>

### **Education:**

Neighborhood Water Watch Volunteer Program: This program was recently established by the Montana Dept. of Fish, Wildlife & Parks. Their brochure states: "The primary role of the volunteer group is to provide information to the public in proper use of water craft on area waters. The group also observes, records and reports safety violations to the FW&P Enforcement Division for investigation. The volunteers receive up-to-date training and are committed to helping the public become more informed about safe boating practices. In many cases, volunteers, while wearing their volunteer vests, make "on the spot corrections" by informing boaters of safe boating practices....In the last two years, over 40 volunteers have been trained for the program. Volunteers have donated over 3,500 hours of their time and made over 5,500 educational contacts."<sup>17</sup>

PWC Safety and Demonstration Day: Seadoo and Jesco Boats of Kalispell sponsor an annual safety and demonstration weekend which will be held June 30 and July 1 this year at KwaTakNuk Resort in Polson. They said they would be willing to set up a demonstration for the Flathead Lakers showing the difference in noise and water pollution between an old model PWC and a new model Seadoo.

## ***Task Force Recommendations***

### **Short-Term Recommendations (this year):**

- 1) Post informational signs about boating rules and regulations at all boat launches.
- 2) Conduct a survey of lake-area residents and lake users to better determine public attitudes toward PWC and possible restrictions (draft of survey attached).
- 3) Host a meeting with FWP, Sheriffs, County Commissioners, Tribes, and Coast Guard representatives regarding enforcement (current efforts, problems, needs, citizen involvement).

- 4) Include an article about FWP's Neighborhood Water Watch in the Lakers' newsletter.
- 5) Ask Jesco and Seadoo to include noise and water pollution demonstrations in their Safety Day program and help publicize this event.
- 6) Publicize phone numbers to call for complaints/enforcement when violations are observed. Develop a program where a post card outlining the incident can also be mailed to the Flathead Lakers so the organization can begin compiling a database on violations.
- 7) Begin a dialogue with the Confederated Salish & Kootenai Tribes about problems and possible solutions, including PWC rentals.

**Long-Term Recommendations:**

- 1) In cooperation with enforcement agencies, develop an education/certification program for PWC rentals.
- 2) Investigate whether there are better sound meters that can be effective in measuring the dBA level of PWCs so the shoreline noise level regulation can be enforced.
- 3) Evaluate the EPA standards to see if the Flathead Lakers and local communities agree they are sufficient to protect Flathead Lake. Find an independent (University) contact (Tahoe, Biological Station, etc.) to evaluate the standards.
- 4) Determine the number of households which use lake water for drinking - this would be useful information if efforts are made to strengthen the EPA emission standards for Flathead Lake.
- 5) Explore the possibility of incentives/requirements for PWC rental concessionaires to replace older 2-stroke PWCs with newer, less polluting machines.

**Other Options to Consider:**

- tax older PWC/2-stroke outboards at a higher rate
- offer a rebate or bounty on the older PWC/2-stroke outboards
- place a surcharge on fines for boating violations to be used for enforcement
- raise funds to contribute toward enforcement efforts
- increase the no-wake distance from shore
- limit hours of PWC use
- restrict PWC use in certain areas
- have the Flathead Lakers take on a goal of having Flathead Lake designated as an Outstanding Resource Water

\*\*\*\*\*

*Literature Cited*

- <sup>1</sup>Tahoe Research Group. "The Use of 2-Cycle Engine Watercraft on Lake Tahoe: Water Quality and Limnological Considerations." Prepared for the Tahoe Regional Planning Agency Governing Board Meeting, February 26, 1997.
- <sup>2</sup>Martin, Laurie C. "Caught in the Wake: The Environmental and Human Health Impacts of Personal Watercraft." Izaak Walton League of America, 1999.
- <sup>3</sup>Environmental Protection Agency. "Emission Standards for New Spark-Ignition Marine Engines." EPA420-F-96-013, August, 1996.

- <sup>4</sup>State of California Air Resources Board. "Proposed Regulations for Gasoline Spark-Ignition Marine Engines, Summary." June 11, 1998.
- <sup>5</sup>Bush, Keith. "Cutting Down on Smoking." undated photocopy.
- <sup>6</sup>Bush, undated.
- <sup>7</sup>American Rivers River Policy Update, February 20, 2001.
- <sup>8</sup>Wagner, Kenneth J. "Of Hammocks and Horsepower: The Noise Issue at Lakes." Lakeline, June, 1994.
- <sup>9</sup>Komanoff, Charles and Howard Shaw. "Drowning in Noise: Noise Costs of Jet Skis in America." A Report for the Noise Pollution Clearinghouse, April, 2000.
- <sup>10</sup>Montana Fish, Wildlife & Parks. "Montana Boating Laws: Summary." 1999.
- <sup>11</sup>Montana Fish, Wildlife & Parks. "Recreational Conflicts on Montana Waters Relating to Motorized Watercraft." February 2, 2000.
- <sup>12</sup>Tahoe Regional Planning Agency. "A Consumer's Guide to Boating at Lake Tahoe." 1999.
- <sup>13</sup>"Supreme Court Upholds Waterbike Ban in San Juan County." 48° North, August, 1988, p.26.
- <sup>14</sup>The Supreme Court of Hawaii. "Kaneohe Bay Crusises, Inc. vs. Hirata." Decided September 24, 1993.
- <sup>15</sup>Wagner, 1994.
- <sup>16</sup>National Transportation Safety Board. 1998.
- <sup>17</sup>Montana Fish, Wildlife & Parks. "Neighborhood Water Watch Volunteer." undated brochure,.

**PWC Task Force Report**  
**April 12, 2001**

***Supplemental Information***

**PWC Pollution:**

The majority of outboard and all PWC engines currently use two stroke technology that emit high rates of hydrocarbon exhaust. “Two stroke or two cycle engines combine intake and compression in one stroke, exhaust and power in another. Fresh air/fuel mixture enters the cylinder while the exhaust port is still open. Therefore, unburned fuel escapes with every cycle.”<sup>1</sup> Also, two-stroke engines run on a mixture of oil and gas. The burning of oil produces polycyclic aromatic hydrocarbons (PAHs), highly toxic compounds. An average of 25% of a two stroke, non-fuel injected engine’s fuel/oil mixture is emitted directly, unburned into the water or air. <sup>2</sup>

According to testimony before the Tahoe Regional Planning Authority,

- “there is some inconclusive research on what happens to the discharged fuel. Several studies suggest that as much as 50% evaporates immediately and an additional 30-40% within eight hours. Unfortunately, because of the number of uncontrollable variables, it is difficult to draw hard conclusions. However, on a “typical boating day on Lake Constance (on the Swiss, Austrian and German border) and in “typical” marina environments, Swiss studies have shown hydrocarbon concentrations well in excess of 8ppb.

- Studies conducted by the petroleum industry initially suggested that much of the unburned and un-evaporated fuel residue was relatively inert. However, new independent research at Michigan State University is showing that all previous studies were conducted under yellow light (a standard procedure to control variables). When these studies are repeated under UV light, an opposite conclusion was drawn. In this case, unburned fuels were shown to contain and/or produce PAH, plus toxic residues of various fuel additives.

- Studies by the Swiss government and Michigan State University showed that PAH concentrations as low as 8 ppb have acute, fatal toxic effects on various forms of zooplankton. Concentrations of 2 ppb were 100% fatal to zooplankton in thirty minutes....PAH concentrations of 53 ppt were shown to reduce the reproduction of zooplankton by 10%....

- PAHs are believed to evaporate very slowly...A PWC and marine industry scientist attempted to counter this by stating that 90% of all PAHs evaporate within eight hours. TRPA (Tahoe Regional Planning Agency) experts countered this by stating that evaporation rates are dependent on a wide variety of environmental and climatic conditions and reiterated that relatively low levels of PAHs are acutely toxic (i.e. exposure time is less of an issue than their existence);...<sup>3</sup>

- Research indicates that in deep, cold, less productive lakes containing less bacteria (like Lake Tahoe and Flathead Lake) volatile hydrocarbons will persist longer than in shallower, more productive waters.”<sup>4</sup>

**Outstanding National Resource Waters Designation:**

A provision in the Clean Water Act (CWA) allows states to designate waters as Outstanding National Resource Waters (ONRW): “where high quality waters constitute an outstanding resource, such as waters in National Parks, state parks, and wildlife refuges, and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.” This classification provides the maximum level of water quality protection under the CWA. Water quality of an ONRW must be “maintained and protected.” The state may not issue a permit for an activity that will permanently lower the water quality of an ONRW. A new direct or indirect (e.g. upstream) source of pollutant to an ONRW may be authorized only if the effect on water quality is temporary and limited.

EPA Region VIII guidance provides that the public may nominate any state water for ONRW protection at any time by written request. It must explain why the designation is warranted

based on one or more of the following factors:

- a) location (is the water body in a national park, wilderness area or wildlife refuge?)
- b) previous special designations (is the water body currently classified as a wild & scenic river?)
- c) existing water quality (e.g. pristine or naturally-occurring?)
- d) ecological value (are any threatened, endangered, or sensitive species present?)
- e) recreational or aesthetic value (is an outstanding recreational fishery present? does it provide exceptional rafting or bating experience?)
- f) other factors that indicate outstanding ecological or recreational resource value (e.g. rare or valuable wildlife habitat)

These criteria are not absolute – other values may be considered.

Montana has placed several restrictions on its process for designating Outstanding Resource Waters (Montana’s term) and no petitions for designation have been submitted. Even if the water body meets all the state’s criteria in addition to the federal criteria above, both the Board of Environmental Review and legislature have unlimited discretion in deciding whether to approve the designation.<sup>5</sup>

### *Literature Cited*

<sup>1</sup>Bush, Keith. “Cutting Down on Smoking.” undated photocopy.

<sup>2</sup>Tahoe Research Group. “The Use of 2-Cycle Engine Watercraft on Lake Tahoe: Water Quality and Limnological Considerations.” Report prepared for the Tahoe Regional Planning Agency Governing Board Meeting, February 26, 1997.

<sup>3</sup>Testimony before the Tahoe Regional Planning Authority, summary. “Air/Water Quality Impacts of Personal Watercraft.” February 26, 1997.

<sup>4</sup>Tahoe Research Group, 1997.

<sup>5</sup>Brawer, Judith M. and Richard Levitt. “Antidegradation Policy and Outstanding National Resource Waters in the Northern Rocky Mountains.” American Wildlands, 1999.