

LAKE WABAMUN RECREATIONAL MOTORIZED WATERCRAFT CAPACITY & ACTIVITY STUDY

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Introduction:

Twenty-five years of surveillance data (1985 - 2009), collected by scientists through marine and satellite testing of 235 fresh water lakes around the world (50% of fresh water supply), has shown that lakes are warming faster than the oceans and the atmosphere. Importantly, seasonally ice-covered lakes in areas where temperature and solar radiation are increasing while cloud cover is decreasing are especially vulnerable to this warming trend (i.e., an average of 0.34 degrees Celsius per decade of fresh water warming, compared to 0.24 C for air and 0.11 C for oceans). This finding makes fresh water lakes more prone to algal blooms, less hospitable to native fish but more attractive for invasive species growth - (O'Reilly CM et al. "*Rapid and highly variable warming of lake surface waters around the globe*" *Geophysical Research Letters* (2015) 42: 10,773-10,781).

This pervasive and rapid warming of fresh water lakes signals an urgent need for all citizens utilizing lake Wabamun for recreational purposes to be environmentally vigilant and become proactive stewards dedicated to preserving this precious but vulnerable lake. In this context, the Wabamun Watershed Management Committee (WWMC) has recently completed an important *Riparian Health Assessment study of Lake Wabamun* (2014), utilizing aerial videography (unmanned air vehicle - i.e., drone) to determine the health status of the lake's shoreline and adjacent watershed zones (i.e., Riparian Management Area). This study revealed that approximately 57% of the RMA is healthy; 9% is moderately impaired and 34% is highly impaired (primarily in areas of residential development where trees, shrubs, bulrushes, cattails and other vegetation have been removed).

Although climate change and other environmental factors play a significant role in affecting the biological health status of Alberta lakes and adjacent riparian areas, they are not usually amenable to human correction in the short term. However, as stewards involved in the protection and health maintenance of lake Wabamun, the WWMC has elected to identify and study preventable human-related influences which may adversely affect the overall stability of the lake. Subsequently, a subcommittee was formed (Sept., 2015) to study the tolerable capacity of motorized watercraft activity on lake Wabamun which has a surface area of 82 kilometers (km) squared, (i.e., 8200 hectares or 20,262 acres), an average depth of 11 meters (36 feet) and a shore length of 57.3 km (35.6 miles). Utilizing the suggested standard of 1 boat per 15 to 25 water surface acres, this equates to **approximately a maximum boat capacity of 1000 - 1100 boats for Lake Wabamun**. It was also suggested that with the development of dedicated lake boat launch facilities, a more accurate census of boat population could be determined for future assessments.

Key Issues discussed by the subcommittee:

(1) **Boating Etiquette:** (i) respect towards waterfowl (loons, grebes, ducks, herons, pelicans, etc.), keeping a distance of at least 200 feet; (ii) right of way for swimmers, canoeists, kayakers, sailboaters; (iii) respect for ecologically sensitive areas (i.e., "ecozones", e.g., fish spawning areas, bird sanctuaries, fragile vegetation; (iv) alcohol consumption avoidance; (v) reduced noise pollution - motors; music audio systems and (vi) discharging sanitary effluent & trash.

(2) **Preservation of Water Quality: Fuel (gasoline & diesel), Oil Emissions and Exhaust: Note:** motorboat technology is lagging behind the automotive industry by 15 years (especially 2-cycle engines).

(a) **Unburnt Fuel:** emission into water through the exhaust system - contains benzene, toluene, toxic aromatic compounds.

(b) **Burnt Fuel:** produces polycyclic aromatic hydrocarbons (PAH's) - linked to cancer and genetic mutations. High concentrations of PAH's bind to lake bottom sediments, are bio-accumulated in animals including humans and are also dispersed into the air we breathe.

(3) **Impact on Geomorphology: (Shoreline/Bank Erosion & Sediment Resuspension)** - especially non-vegetated, non-compacted soils and sandy beaches.

Motorized watercraft: motor boats, personalized watercraft, etc.,:

(i) *Erosion impact* on shorelines is dependent on shape of boat hulls, boat speed, depth of water (i.e., less than 10 feet), distance from shore (i.e., “10 / 30” Rule”): “**10 km/hr within 30 meters (100 ft.) from shoreline** *** **Prevention Strategy:** *Buoy placement:* at least at 10 foot water depth line or 100 meters from shoreline to reduce adverse effects of boat-created wave/ wake action.

(4) **Injury to Aquatic Ecosystems:** (i) vegetation (shoreline shrubs, bulrushes, cattails etc.); (ii) fish injury, disturbance to waterfowl nesting, wildlife (beavers, muskrats, etc.); (iii) Sediment re-suspension - releasing sediment-bound phosphates, PAH's ; (iv) Seedling displacement.

(5) **Turbidity Impact on Plant & Fish Communities: Note:** Propeller, hull and wake turbidity) - is directly proportional to the depth of water (turbidity is greater in water < 2.5 meters); (i) decreases light penetration, resulting in less growth of submerged aquatic vegetation; and (ii) reduces visual acuity for feeding fish.

(6) **Noise Pollution:** One of the most emotive and subjective issues associated with motorized boating. (i) *engine noise:* can be reduced by water-cooled manifolds, flexible engine mountings and sound-absorbing cowlings; (ii) *Slap action noise* of boat moving through water at high speeds; (iii) *Loud voices and music audio systems.*

*** **Note:** British & American Waterskiing Federations have approved **75 dB** as the acceptable maximum standard for noise for ski boats travelling approx. 30 meters (100 ft) from the shore at speeds between 22 & 37 MPH. Furthermore, the British Waterskiing Federation recommends a limit of **55dB** for sensitive areas (i.e., similar to conversational speech).

(7) **Human Safety & Preserving Lake Happiness:** installation of buoy's at 30 meters (100 feet) from shore to enhance water safety and reduce noise pollution and boat wakes.

Decision Considerations:

In keeping with our Wabamun lake riparian area stewardship mandate (although with limited jurisdictional power), the WWMC subcommittee has elected to continue its efforts in promoting limnological education to lake property owners, the lake-utilizing public and county and summer village administrators as a preventative strategy to maintain the stability, sustainability and preservation of human safety and enjoyment of this fragile recreational area. As an adjunct educational resource to the *Riparian Health Assessment Study*, which identified highly sensitive and impaired lake and watershed “ecozones”, a brief review of the possible negative impacts of rogue recreational watercraft activities and preventative strategies as aforementioned is included. As a second initiative, the subcommittee will begin dialogue this spring with lake Wabamun summer villages, lake associations and others interested in purchasing buoy's to help reduce shoreline erosion and littoral zone damage, maintain water quality and especially to reduce boat-related human accidents. This initiative was recently instituted at Fallis Bay, resulting in excellent compliance and overall citizen satisfaction. As a third initiative, the subcommittee supports continuing discussions with County administrators relating to the importance of timely decision-making regarding the identification and construction of **dedicated boat launch facilities** (including supervisory personnel to monitor boat volumes, operator license requirement, inspection of boats for invasive species; boat cleansing pads, parking and toilet facilities). These strategically placed boat launch facilities would help resolve the ongoing confusion, frustration and emotional turmoil of motorized boaters and cottage owners and would certainly reduce ongoing shoreline damage and enhance overall surveillance, viability and sustainability of Lake Wabamun.

Sincerely, Kenn Petruk January (2016)

