ONTARIO RIVERS ALLIANCE

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Susan Humphrey
Associate Regional Director General – Ontario
Environment Canada
And
GLWQA Nutrients Annex co-lead (Canada)
867 Lakeshore Road
Burlington, ON
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By Email: Susan.Humphrey@ec.gc.ca
Sandra.E.George@ec.gc.ca

Dear Ms. Humphrey and Ms. George:

Re: Environment Canada Consultation on Proposed Bi-National Phosphorus Load Reduction Targets for Lake Erie

Ontario Rivers Alliance (ORA) is a Not-for-Profit grassroots organization acting as a voice for a growing and diverse network of stewardships, associations, and private and First Nation citizens who have come together to protect, conserve and restore healthy river ecosystems all across Ontario.

ORA is pleased to follow-up with formal comments resulting from Robert Huber's attendance at the 22 July 2015 consultation regarding the proposed Bi-National Phosphorus Load Reduction Targets for Lake Erie. ORA makes the following comments and recommendations with the support and agreement of those listed at the bottom of this correspondence.

1. What do you think about the recommended phosphorus reduction targets?

   A 40% reduction across the board for total loading into the system is ambitious and a step in the right direction. However, in order to achieve these targets, it will require a holistic approach with some difficult decisions and significant investment across all levels of government. Larger watersheds will require closer partnerships, communication and accountability towards delivering on those commitments.

   Lake Erie relies on its tributaries as spawning and feeding grounds for the numerous fish and fauna species that move throughout its region and contribute to a multi-billion-dollar commercial and recreational fishery.

   These rivers should not be treated as conduits or pipelines for cities and rural areas in which to jettison its stormwater runoff and wastewater, but instead as a rather complex

ecosystem that is connected - from plankton to mollusks, caddis larvae to brook trout, turtle to bald eagle, and in many areas supplies the drinking water that nourishes our most vulnerable. If one part of this interconnected ecosystem fails, the whole system will be compromised. You cannot have healthy lakes and clean drinking water without a strong commitment and investment into improving the health of the entire system.

2. What do you think about our not recommending phosphorous reduction targets for the eastern basin of Lake Erie at this time?

An effective solution is a holistic approach. In order to make significant change, it is imperative that we address all the watersheds and tributaries that drain into Lake Erie. The lake is simply a large container where wind and lake currents mix and move nutrients throughout the basin. It is doubtful that isolating mitigation efforts to only parts of Lake Erie can have the desired effect when nutrients continue to flow uncontrolled from eastern tributaries and watersheds into other parts of Lake Erie.

For instance, the Grand River Watershed drains into the Eastern Basin of Lake Erie, and makes a significant contribution to phosphorus levels in Lake Erie. It should therefore be included in any phosphorus reduction targets.

Regarding the Grand River and its tributaries, the median total phosphorus levels during high spring flow at Dunnville are 4 to 12 times above the provincial objective of 0.030 mg/L, and are generally considered to make a substantive contribution to the near shore of the eastern basin of Lake Erie. The phosphorus levels above Shand, Dunnville and Caledonia Dams far exceed the provincial objectives, even without the pervasive combined sewer overflows and/or frequent wastewater treatment plant bypasses taking place.[1] According to a 2003 to 2008 Grand River Conservation Authority Water Quality report, "*Generally, nutrient concentrations in the Grand River ranks 3rd of 30 Ontario rivers with respect to total phosphorus concentration, after the Don and Thames Rivers (2001-2006, (MOE 2009))*."[2]

Clarity around what is meant by targeting near shore areas is necessary when it is evident that what has occurred on the beaches and in the water of Lake Erie has been precipitated by what is done to the water bodies in the cities and fields far from those shores.

3. What do you think about the watersheds identified for phosphorus reduction?

As per our answer to Question 2 above, it is essential that all watersheds/tributaries draining into Lake Erie are included in the phosphorus reduction targets. Leaving the Grand River Watershed and the entire Eastern Basin out of the plan amounts to a piece meal approach that undermines and threatens the desired outcome of a 40% reduction in Lake Erie phosphorus levels.

[1] Water Management Plan: Technical Memorandum, Report No: WMPSC-2011-06-01, June 7, 2011. To: Grand River Water Management Plan Steering Committee, From: Water Quality Working Group. Re: Conceptual Understanding of Phosphorus Delivery in the Grand River.
[2] Water Quality in the Grand River Watershed: Current Conditions & Trends (2003-2008), H.A. Loomer and S.E. Cooke, Draft October 2011, Grand River Conservation Authority.

4. Is there anything else you want to tell us?

Impacts of Wastewater Treatment Facilities

A large contributor to high phosphorus levels and pollution in Lake Erie is due to the frequent bypassing of untreated and undertreated wastewater effluent into its tributaries. Today's antiquated system of combined sewer and storm water infrastructure are not equipped to adequately handle the extreme rain events caused by a warming climate.

For example, the City of London is likely very representative of many other towns and cities throughout the Great Lakes watersheds. It is the largest city on the Thames River and has been under intense scrutiny regarding its combined sewer systems, and the increasingly prevalent releasing of untreated and partially treated wastewater effluent into the environment as a result of extreme rain events.

According to the City of London's 2015 wastewater reports up to 28 June 2015, 55,060,000 liters of raw untreated wastewater and 199,464,000 liters of wastewater with only solid bio-mass removed, has bypassed treatment and been released directly into the Thames River.[3] Over the last 13 years, from 2002 to 2014, the average annual volume of Raw Bypass (untreated) sewage released into the Thames River was 181,000,000 litres, and in addition, 574,000,000 litres of Secondary Bypass (partially treated) sewage.[4]

The Thames River has experienced excess nutrient levels for decades, resulting in nutrient enrichment in the river system. Therefore, the Lake Erie Binational Nutrient Management Strategy, a product of the Lake Erie Lakewide Management Plan, identified the Thames River as one of the priority rivers delivering excess phosphorus to Lake Erie and a key Ontario watershed impacting on Lake Erie's West Basin.[5]

Taxpayers have invested heavily in improved wastewater treatment facilities and stormwater management, and yet the problem is on the rise all across the country.

The mindset that "dilution is the solution", and that our infrastructure problems are too costly to fix in the short term is a big part of the problem. Wastewater treatment facilities of the past were not designed with climate change in mind, and can seldom handle the extreme heavy rain events that results in untreated and undertreated wastewater being released into the environment.

The Thames River empties directly into Lake St. Clair before flowing into the Detroit River and eventually arriving in Lake Erie. For that reason, would Lake St. Clair be prioritized as a near shore area of concern?

[3] City of London – 2015 Bypass and Overflow Data
[4] Thames River Water Quality 2014, City of London, Environment and Engineering Services, March 2015 – Purpose: To present information on the water quality of the Thames River for 2014.
[5] Freshwater Research, Water Quality Assessment in the Thames River Watershed – Nutrient and Sediment Sources, Prepared by Gertrud Nurnberg, Ph.D., Bruce LaZerte, Ph.D., Freshwater Research. Prepared for The Upper Thames River Conservation Authority, London, Ontario, 30 March 2015.

Recommendation 1: All wastewater treatment facilities releasing effluent into the tributaries feeding Lake Erie be assessed to determine their effectiveness and ability to adequately treat effluent before it is released into the environment. If treatment capacity and/or quality is found to be inadequate, then monies must be provided to resolve the root problem, and/or upgrade the facilities to a standard which can effectively treat all effluent before it is released into the environment.
Recommendation 2: It is imperative that legislation and policy are in place to require enhanced monitoring, compliance, and accountability, as well as to direct funding towards finding effective solutions, and to significantly upgrade wastewater capacity and treatment.

Impacts of Dams and Reservoirs

The Grand River Water Quality report mentioned previously also discusses the impact of its seven major multi-purpose dams and associated reservoirs on water quality in the Grand River Watershed, "*…. water quality is commonly decreased down-stream of the dams. In particular, elevated total phosphorus, soluble reactive phosphorus (i.e. phosphate) and ammonia-nitrogen levels as well as low oxygen levels is apparent. Monitoring data of Belwood, Conestogo and Guelph reservoirs (Guildford 2006) confirm that the water bodies are thermally stratified in the summer and fall which creates oxygen depletion above the bottom sediment that subsequently releases phosphorus to the bottom waters of the reservoir. Because these reservoirs have bottom and mid-depth outlets, such accumulated substances are flushed downstream. Upon mixing events the internal phosphorus load fertilizes the photogenic zones leading to cyanobacterial or blue-green algae blooms in the reservoirs (Guildford 2006) and possibly the downstream river sections. Similarly, a study in the southern Grand River observed that algal biomass increase upon impounding and that sediment oxygen demand is high throughout the reach (Kuntz 2008). Consequently, the effect of reservoirs can probably explain several of the water quality issues in the downstream river sections and should be evaluated in more detail."*[6]

"On-line dams in Caledonia and Dunnville also play a role in the phosphorus dynamics in the river. More detailed assessment of the southern Grand for a Canada-Ontario Agreement sponsored project in 2004 illustrated the influence of the dams in which phosphorus levels tended to 'spike' just above the dams. A build-up of phosphorus-rich sediment; the lake-like behavior of the river behind these dams; and localized biogeochemical processes likely contributes to the increased phosphorus levels found in the lower river reaches."[7]

Lake and river water quality and temperatures are altered when we restrict the flow of the rivers to be held back in reservoirs. With so many of our watersheds controlled by dams; there needs to be further investigation into how reservoirs, and their frequent drawdowns, result in massive spikes in methane emissions and downstream pollution.[8]

[6] Water Quality in the Grand River Watershed: Current Conditions & Trends (2003-2008), H.A. Loomer and S.E. Cooke, Draft October 2011, Grand River Conservation Authority. P-168-169
[7] Ibid, P-5
[8] Dam Drawdown an Overlooked "Global Warming Culprit", by Katy Yan, International Rivers.

Of Special Concern - Springbank Dam: The City of London and the Upper Thames River Conservation Authority (UTRCA) own and operate a recreational dam on the Thames River strictly for the purpose of creating a summer reservoir for a small group of rowing enthusiasts. This dam is currently broken; however, there is a movement to repair it, and should they be successful, it will allow the untreated bypasses from Greenway, Vauxhall and Pottersburg wastewater treatment facilities to accumulate massive loads of phosphorus and bacteria in the reservoir above the dam. This contained reservoir would hold back water, where it would warm significantly throughout the summer months, accumulating plant, algae and fecal matter, in an oxygen depleted environment that would encourage harmful toxic algae to bloom. This would create a dead zone ecosystem with elevated phosphorus and e-coli levels so high that rowing club members have been encouraged to shower with their clothes on if they fall in.

When the summer fun is over, the City of London and UTRCA flush the reservoir as if were a toilet bowl; the residue flushes downstream to Lake St. Clair and on into Lake Erie.

If Springbank Dam is repaired next year, and we continue to allow the City of London to release untreated and partially treated wastewater into the system, there is no possible way the 40% reduction target can be achieved.

Those expected to act on the proposed phosphorus targets cannot ignore this information, or the direct cause and effect of dams and reservoirs on water quality, and especially dams used solely for recreational purposes. Those who ignore this information should be held fully accountable for contravening their commitments.

The efforts of the Ontario Rivers Alliance, and member organizations such as the Thames River Anglers' Association, along with many other local groups working to improve water quality in both the rivers and lakes of the region also contribute significantly towards identified targets regarding climate change, specifically the reduction of greenhouse gases.

Recommendation 3: All dams within the tributaries of Lake Erie are assessed to determine their contribution to degraded water quality. In many cases the only responsible economic and socially sustainable solution may be to decommission dams that do not serve a direct flood control or power generation purpose.

Agricultural Practices

Agricultural practices can make a large contribution to nutrient levels in the creeks, streams and rivers feeding the Great Lakes. Sustainable farming and best management practices that include soil, livestock, fertilizer, herbicide, pesticide and manure management, fencing and vegetative buffers around water bodies, as well as protecting and conserving wetland areas, are all key to reducing nutrient run-off.

Recommendation 4: Sustainable farming and best management practices must be promoted and incorporated into all strategies and policies designed to address nutrient reduction in the Great Lakes.

Climate Change and Wetland Protection

"*Climate change is the critical issue of our time*."[9] Healthy wetlands are the key to successful adaptation to the extreme effects of climate change. Wetlands help to moderate the effects of flooding by reducing influx into stream systems immediately following rainstorms, they provide important habitat for endangered species, aquatic life, migratory birds, wildlife, and serve to reduce erosion, filter contaminants, and help absorb or buffer the effects of drought and flooding.[10],[11] Inadequate wetland protection, and destruction of wetland habitats, compound the problems generated by extreme changes in seasonal rainfall.

Recommendation 5: There is an urgent need to integrate climate change and wetland protection into development and infrastructure strategies and policies.

Recommendation 6: In order to make real and significant change, the above measures must be applied to all of the Great Lakes, as they are interconnected, and all are in decline. A federal Great Lakes Protection Act, similar to the one proposed by the Ontario government, must be enacted in order to address water quality issues in all of the Great Lakes.

We are grateful for this opportunity to comment.

Respectfully,

Linda Heron
Chair, Ontario Rivers Alliance

Robert Huber
Thames River Anglers' Association

[9] *Ontario's Climate Change Discussion Paper 2015, Minister's Message, Glen Murray, Minister of Environment and Climate Change. P-3.*
[10] *Freeze and Cherry, 1979; Jones, 1997; Hornberger et al., 1998.*
[11] *Natural Resources Canada. 2007. From Impacts To Adaptations: Canada in a Changing Climate 2007, P-235.*