

Alliance of Pigeon Lake Municipalities & Pigeon Lake Watershed Association Winter Newsletter



Season's Greetings!

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NEW Approach for the Pigeon Lake Watershed Management Plan (PLWMP)



***A joint initiative of the Alliance of Pigeon Lake Municipalities & the Pigeon Lake Watershed Association
Working Together for a **Healthy Lake**, **Healthy Watershed**, **Healthy Community**!***

Pigeon Lake needs our help because over the years our many land use changes have added up and impacted the lake. These cumulative impacts now require collective action and cumulative solutions.

What we've done for the lake over the last few years has been good. Together, we tackled the low hanging fruit, one topic at a time. We've stopped most of the use of lawn fertilizers, healthy lake regulations are being brought in, many people have made lake stewardship changes and are starting to take Clean Runoff Actions... and the lake needs more.

We have enough information, commitment and support to now move forward in a more comprehensive manner. The Alliance of Pigeon Lake Municipalities (APLM), the Pigeon Lake Watershed Association (PLWA), the Government of Alberta (GoA), plus our healthy lake partners and community members are building on what we've done and pulling what is now known into a watershed plan to give everyone the direction needed for coordinated action.

Improving the lake health requires changes on the land, the shore and in the lake. Watershed plans provide action recommendations for residents, acreage owners, farmers, recreation facility operators, municipalities and elected officials around the lake and its watershed. Your support for the plan will galvanize action.

Timeline

A draft plan is currently being written. In late winter/ early spring municipal leaders will give their input to be able to support the plan. Different opportunities will be given to as many people as possible to learn, discuss and add shape to it so that it will be based on both science and community considerations. This will be your opportunity to speak up and make it a plan that people will support and act on.

The final draft plan is targeted for completion in late spring before the next municipal elections. The plan will identify a range of important and will not interrupt the current on-going Clean Runoff Project or other important work for the lake but better enable us to move forward on multiple initiatives simultaneously.

The Pigeon Lake Watershed Management Plan (PLWMP)

This plan will inform the provincially-led North Saskatchewan Regional Plan (which includes Pigeon Lake), as well as other regional agreements such as Inter-municipal Development Plans (IDP). What goes in this plan will be what we as individuals, communities, local, regional and provincial governments will do.

The plan will incorporate what we've learned, our work to date and what else we need to do.

- The inputs (Pigeon Lake reports/studies as well as established lake science)
- The bulk of the plan will be about Lake Management Actions for:
 - **The Land** - Protection and/or restoration of some land / wetland / shoreline areas as well as approaches to offset current land use practices; lake stewardship, nutrient runoff reduction practices, and new landscaping approaches.
 - **The Shore** – Address riparian issues and continue to implement clean runoff actions.
 - **The Lake** – The management of the phosphorus in the sediment, the cyanobacteria, the fishery, aquatic life and water conservation.

This plan will encourage people at all levels to choose to get involved and make a difference for Pigeon Lake.

Watershed Action Update

Much great Clean Runoff work was done this summer and fall thanks to over 100 volunteers and many contributors! Thanks everyone!

- **Alberta Clean Runoff Guide:** The “official” draft for what, why and how we can all help the lake is now available at www.plwmp.ca for Pigeon Lake residents. It is in downloadable sections. Though a draft, the Guide has already received very positive feedback as an easy, interesting read and important tool for the lake. Since we must further minimize the nutrients and other pollutants going into the lake, we encourage everyone to become familiar with it.
- **Demonstration sites:** Techniques from the Guide were used to create functional demonstration sites. So far, three municipal sites at Ma-Me-O and Mission and three residential sites were installed plus a shoreline restoration site (See the “Shoreline On-the-Ground Action Update”. A range of approaches and deep rooted plants were used:
 - o Different rainwater diversion techniques show how people can slow, filter and clean their runoff.
 - o All sites have some combination of hardy, deep rooted native plants that do not require fertilizers. The PLWA will continue to work with native plant providers and interested local suppliers such as Sherwood’s Forests Tree Farm.
 - o Many of the plants selected are pollinators which help the bees, attract the hummingbirds and provide a show of colour.
 - o A range of shrubs, grasses and planting techniques were used. Grasses come in many interesting varieties which have a wide range of tolerance for wet and dry areas. Many better-for-the-lake grass varieties are good for lawns for activities, as well, as some for deliberate “no mow” lawn areas.

These demonstration sites will become established over the next couple of years and will inspire others to do their own versions.



What You Can do for Pigeon Lake in the New Year - Please Join IN!

Have property at Pigeon Lake? Shoreline? Backlot? Acreage? Estate? Farm? Everyone is part of the lake’s health.

- 1) **As individual land owners.** Please, over the winter learn more. Read the Clean Runoff Guide. Decide what you want to do in 2017 for the lake on your property. Evaluate your lot runoff.
- 2) **As a community member.** PLWA will work with small neighbourhood groups via phone meetings with people who are willing to step up to find engaging, positive ways to inform, inspire and support people in their community to make changes.

The lake needs the Clean Runoff Project to keep rolling. The PLWA has resources to help neighbourhoods take part, so [email Susan](mailto:susan@plwa.ca) to learn more: send your name, phone number and location in the Pigeon Lake Watershed. Conversations for action will start the beginning of March. Thanks!



Shoreline On-the-Ground Action Update



Thanks to a Blue Water grant secured by Cows and Fish and the Alberta Low Impact Development Partnership; the go ahead from Alberta Environment and Parks; and an approval from the Golden Days Council, a bio-engineering shoreline restoration project was completed on a chilly day October 24th. This an experimental project is another Clean Water Project demonstration site.



The horizontally buried willow bundle.



Vertically planted willow cuttings.



The Team: Cows and Fish and the PLWA.

A hardy team from Cows and Fish and the PLWA, removed invasive plants using different methods for the different plants, then buried bundles of dormant live willows and vertically planted willow cuttings. We are looking to learn if these cuttings will survive and thrive in this sandy soil. If so, willows are so hardy that once they are established they can be cut to allow a lake view and provide serious competition for the invasive plants which will try to re-establish there. It is important to have plants and other deep rooted vegetation on the shoreline as this transition zone is the last filter as the runoff enters the lake.

Wastewater System Update

PLWA Wastewater System Position – In October, the PLWA Board discussed and reconfirmed our position on the wastewater system:

“The PLWA has always been a declared supporter of the Regional Sewage System concept. The PLWA continues to be concerned about active septic fields in close proximity to the lake as an environmental stewardship matter. Solving the municipal details of sewage disposal consequential to decommissioning of septic fields is not an environmental stewardship matter. We respect that each of the municipalities must as the owners, determine their local wastewater systems options.”

Wastewater System Update

First, regarding Phase 1 of the regional line, the line has been fully operational since mid-March of this year and the system is running very smoothly with no major issues. The Westeros Lift and Truck Dumping Station continues to be open seven days a week from 7 am to 7 pm.

Furthermore, the County of Wetaskiwin along with our municipal partners we were informed that we will receive ninety (90) percent of eligible project costs of Phase 2 of the Pigeon Lake Regional Wastewater System, or up to \$6,426,988 for the project from combined provincial and federal sources. Alberta Transportation staff will be contacting Administration in the near future to make arrangements for the grant payments to occur and

WSP Canada Inc. has been retained to complete the detailed design of Phase 2, which will connect to the already completed Phase 1 of the Project at a point near the Village at Pigeon Lake and will travel along southwestern portion of Pigeon Lake in order to adequately service the Summer Villages of Grandview and Poplar Bay and various subdivision areas of the County of Wetaskiwin.

Also, the municipalities on the southern portion of Pigeon Lake have also submitted an application for the formation of a regional services commission to the Government of Alberta. The Government of Alberta is currently reviewing the application and a decision should occur within the next few weeks/months.

Finally, in terms of the internal wastewater lines for the communities on the southern portion of Pigeon Lake, the first tender closed for the areas of Viola Beach, the Village Lane Condos, Norris Beach, and a line from Highway 13 along Highway 13A to Ma-Me-O Beach. MPE Engineering and municipal administration are currently reviewing the tenders and more information will be released to the public in due course with construction hopefully completed by mid-2017. County of Wetaskiwin Administration will also be moving forward in establishing local support within other areas of the County such as Beachside Estates, VPL Commercial, and other areas through use of local improvements as was the case for the Village Lane Condos and Viola Beach. For further information, view the County of Wetaskiwin's October 20th, 2016 [VIOLA BEACH AND VILLAGE LANE CONDOS LOCAL WASTEWATER COLLECTION LINES PROJECT UPDATE](#).

Lake Action Update

Research into Bioremediation and Nutrient Recovery by the Mechanical Harvesting of Algae

The University of Alberta research project on Pigeon Lake finished its second year using “mesocosms” to test the effects of minnow population on cyanobacteria growth. It was thought that the high population of minnows has severely reduced that population of zooplankton and thereby removing the algae grazers. The scope of this project was to determine if changes to the ecological balance in the lake have caused changes in water quality and if bioremediation, the process of adjusting food web, would provide a means of reducing the intensity of the algae blooms. While the results of the study did show a noticeable diminishment in water clarity from algae growth as a result of the presence of minnows, the reason was different than anticipated. The results showed a definite increase in total phosphorous in the presence of minnows and the growth of cyanobacteria. This increase is thought to be as a result of phosphorous cycling by the minnows. Further research is being planned for the coming summer with the possibility of two graduate students being involved in the project.





UofA Dr. Vinebrooke explaining the Pigeon Lake Trophic Cascade study to Municipal Councillors and the PLWA. The series of blue tubs, each called a mesocosm, is simply an outdoor experimental system that allows, in our case, the examination of a portion of the lake's natural environment under controlled conditions.

Cyanobacteria samples were also taken in support of a feasibility study on nutrient recovery through algae harvesting. The analyses of these samples are expected shortly and will be incorporated into the feasibility study planned for this coming winter. Grant funding requests for this study have been made. We have found other locations where nutrient recovery by the mechanical recovery of algae is being done however, for a lake as large as Pigeon Lake, it must be realized that the challenges to recover a meaningful amount of nutrient are monumental.

In-lake Option Research

The In-Lake Technical Committee (ILTC) is investigating in-lake options to reduce the frequency of the algae blooms caused by the high concentration of phosphorous in the lake. The report "Pigeon Lake Phosphorous Budget" prepared by the Alberta Government and the testing that was carried out by the ILTC shows that the majority of the phosphorous is found in the lake sediment. Experts have determined that for a high eutrophic lake such as we now have at Pigeon Lake, there will not be any improvement with the algae problem without in lake intervention to either remove or sequester the phosphorous in the sediments.

Based on this information, methods to sequester the phosphorous are being investigated by the ILTC. The ecosystem of the lake is very complex therefore the science of the options must be thoroughly assessed to ensure that any treatment recommended will be in the best interests of the residents and users and not endanger the fish, birds or wildlife of Pigeon Lake

The present water elevation at the lake is very low – about 0.4 m or 16 inches below the weir elevation. With the possible advent of low snowfall this winter and average precipitation this next year, the water level could recede even further. To ensure that the recreational value of the lake is maintained or improved in the long term, continuing water transfer is being investigated by the ILTC. At this time, a potential source of compatible water has been identified.

Check the current water levels on the Alberta River Basin's website: <https://rivers.alberta.ca>

Pigeon Lake 2015 Lakewatch – a true collaboration!

This Alberta Lakewatch Program is a water quality monitoring program funded for many lakes by the GoA, administered by the Alberta Lake Management Society (ALMS), and assisted by lake volunteers. Periodically, the GoA uses these data to analyze how the lake water is changing over time (the last Long-Term Trends in Alberta Lakes report was done in 2011). The Lakewatch Program runs at selected lakes about every 3 years.

At Pigeon Lake it runs every year because the PLWA and the APLM agree that annual testing of water temperature, clarity, a suite of water chemistry parameters and checking for invasive species is needed. Some summer villages give money to the PLWA who ensure it happens.



As part of this program, ALMS produces a report summarizing the data in a relatively easy-to-understand manner. The [Pigeon Lake 2015 Lakewatch Report](#) is available on www.plwa.ca > documents > water quality. Information included in this years' report includes key:

- Dissolved oxygen levels did not fall below the protection for aquatic life guidelines on each of our sampling trips (minus September when the probe broke... darn!)
- No mussels or spiny water flea detected. (... or other Aquatic Invasive Species. Yeah!)
- The water column was warm in 2015 (Just over 18 degrees Celsius was observed above the sediment on July 27th.)
- The lakes' Total Phosphorus and Chlorophyll-a concentrations have risen over the years.

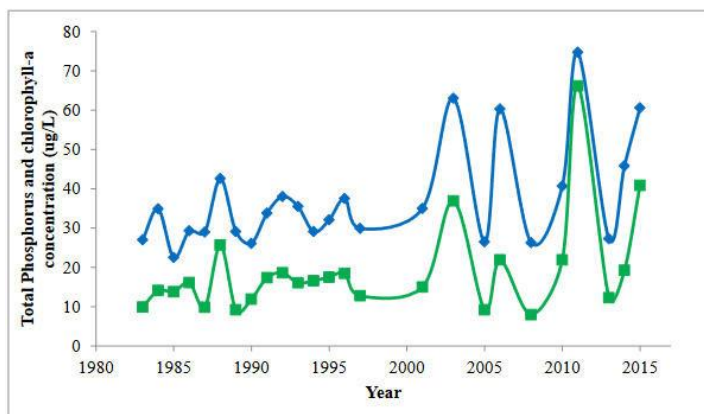


Figure 6 – Historical total phosphorus ($\mu\text{g/L}$) and chlorophyll-a ($\mu\text{g/L}$) concentrations measured at Pigeon Lake from 1983-2015.

Table A - Trophic status classification based on lake water characteristics.				
Trophic state	Total Phosphorus ($\mu\text{g}\cdot\text{L}^{-1}$)	Total Nitrogen ($\mu\text{g}\cdot\text{L}^{-1}$)	Chlorophyll a ($\mu\text{g}\cdot\text{L}^{-1}$)	Secchi Depth (m)
Oligotrophic	< 10	< 350	< 3.5	> 4
Mesotrophic	10 – 30	350 - 650	3.5 - 9	4 - 2
Eutrophic	30 – 100	650 - 1200	9 - 25	2 - 1
Hypereutrophic	> 100	> 1200	> 25	< 1

The 2016 Lakewatch Report is targeted for release in the spring of 2017.

Notes of Interest

PLWA Reorganized With projects and a lot of other important work for the lake continuing to be done by the PLWA alongside the resignation of the Program Manager, the board has reorganized. The following changes have been made: Susan Ellis has stepped off the board and is now the Executive Director Wayne Buskas is the President, Bob Gibbs is the Treasurer and Daniel Kenway is Vice-President. Leslie Kaun continues to be the PLWA Secretary.

The PLWA Annual Report! Now posted on the www.plwa.ca home page under NEWS. Enjoy the brief, friendly format which summarizes most of the work from the fall of 2015 through 2016. Feedback is welcome to



New Comer Packages Another 100 New Comer Packages were created and most given to the Summer Village Administrators to distribute to new neighbours. The lake needs all of us to realize that living at the lake is both a privilege and a responsibility, so the PLWA has been working with the SV Administrators over the last three years, to get key information out to new people to help them to make healthy-lake decisions right off the bat. You can help by asking your new neighbours if they have received theirs. The packages include lots of great lake information including such items as: On the Living Edge, a couple of sections of the draft AB Clean Runoff Guide and Working Wells.

The PLWA also have a number of “Green Acreages Guide Primers” that we’d be happy to send to acreage owners – requests can be sent to plwainfo@gmail.com.

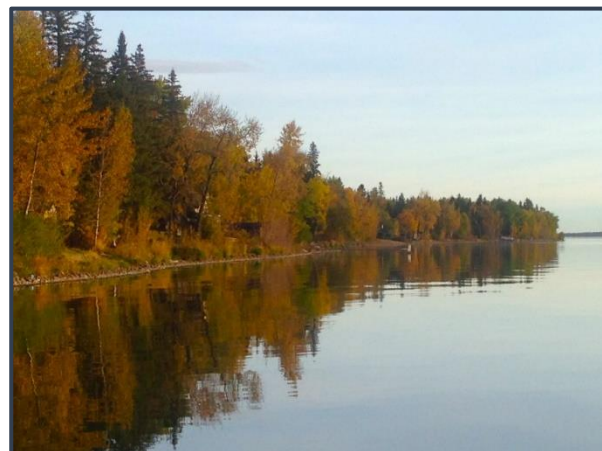
Pigeon Lake Meeting Room in Rogers Place and the Submitted Lake Pictures!

Rogers Place has meeting rooms that are being named after places around Edmonton. One is being named the Pigeon Lake Meeting Room. A request to please submit six pictures for the Meeting Room in five days. So, we delved into our pictures and got a couple more. To have a wee bit of fun we posted thirteen on the Pigeon Lake Watershed Association FaceBook page and asked people to help us choose. 660 people viewed them and a few people even helped us choose the finalists. Three of the six will be chosen for the meeting room. Permission is required to reproduce the pictures.

Hauptmans, Poplar Bay



Bob Gibbs, Silver Beach



From

Daniel Kenway, Sundance



Susan Ellis, Itaska



Questions and feedback are welcome

[Email](#) both of us with a click or...

Brian Waterhouse from the Alliance of Pigeon Lake Municipalities at bwaterhouse@sundancebeach.ca

Susan Ellis from the Pigeon Lake Watershed Association at plwainfo@gmail.com

Thank-You