Observations of water levels in Beaverhill Lake in 2017

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History of the Lake

Beaverhill Lake, located just east of Tofield, Alberta was historically known for being a large (139km^2) shallow lake with a maximum depth of only 3m (BBO, 2017). This body of water was world renowned for being a birding hotspot because of the abundant number of shorebirds, waterfowl, grebes and many other species that either nested there or stopped during migration (BBO, 2017). It had large mudflats along the south and east shores for waders to feed on, an island on the north side of the lake that had an American White Pelican colony, and a Franklin's Gull and Eared Grebe breeding colonies along it's southeast shorelines (Lister, 1976).

Beaverhill Lake was declared a Wetland of International Importance in 1987 and an Important Bird Area of Global Significance in 1997 (BBO, 2017). Still to this day, it is a great place to go birding for abundant bird diversity seen in the summer and on migration. Lister Lake, located near the southeastern shores of Beaverhill Lake, is connected to the larger lakebed and is a permanent body of water with the level controlled by a weir built by Ducks Unlimited to create duck habitat. It provides vital water habitat for numerous waterfowl that pass through and breed in the area. As well, the aspen forest and willow stands that edge the lakebed are great habitat for migrating and breeding passerine bird species.

Beaverhill Lake has been dry since 2005 (BBO, 2017). In 2005 staff of the Beaverhill Bird Observatory (BBO), located along the southern shores of the lake, recorded that the lakebed had receded dramatically and they noted a shift in bird species presence because of this change in water levels (BBO, 2017).

2005 was not the first time Beaverhill Lake had dried up. It has been dry twice before in recorded history- once in the early 1930s and again in the 1950s (Lister, 1976), suggesting a cycle of dry and wet years. It has remained dry since 2005 until the BBO staff recorded the return of water in 2016.

2016 Water Levels

During the summer of 2016, the BBO staff observed water returning to Beaverhill Lake during heavy rains that occurred in July. Snowfall and rains from January 1st to October 31st 2016 resulted in a total precipitation accumulation of 495.3mm, which compared to the average accumulated precipitation in the last decade of 320.7mm, is a significant increase (Agriculture Alberta, 2017). This resulted in a high water table that fell when the ground froze and this likely helped lead to the high water levels seen in the subsequent year.

2017 Water Levels

April 1st, 2017 BBO staff and volunteers returned to their work site and took a walk out to the weir, where Lister Lake flows into Beaverhill Lake. The normally

grassy " Duck Drive", a trail that parallels the Beaverhill lake bed, was inundated with water flowing into the lake at levels deeper than 30 cm, unfortunately just above the levels of rubber boots! The weir, which normally receives a trickle of water, was overflowing with large volumes of water re-filling the lake.

Photo on Right:
BBO Staff and volunteers walking down Duck Drive on April 1st 2017.
Photo Credit: Sara Pearce Meijerink

Twice during the 2017 season local pilots took photos documenting the extent of the Beaverhill lakebed.

Photo on Left:
On May 5th, pilot Ben Match posted this photo to Facebook showing the large amount of water currently in Beaverhill Lake.
Photo Credit: Ben Match

Then on May 10th, the BBO staff flew an aerial survey of Beaverhill Lake to better document the extent of the water and estimated that 70% of the historical lakebed was flooded with 50% containing open water (BBO 2017).

Photo on Right: Beaverhill Lake from the East shore looking South. Photo Credit: Sara Pearce Meijerink

On October 7th, pilot Paul Ferron posted a photo (Left) on social media showing that open water was still present in the Beaverhill Lake bed.

Photo Credit: Paul Ferron

Between January 1st and October 31st, Environment Canada's Shonts Weather Station recorded that the Beaverhill Lake area received a total of 358.9mm in accumulated precipitation (Agriculture Alberta, 2017).

Throughout the spring, summer and fall seasons, I photographed the water levels at the weir between Lister and Beaverhill Lakes to document the seasonal changes.

See Appendix 1 for the full photographic documentation.

What does this mean?

It would seem that the large amount of precipitation in 2016 must have refilled the water table back to a reasonably high level. Since there was still so much water present that fall, it is safe to assume that when winter hit, the water table froze solid. In the spring of 2017, this then allowed the snowmelt to run off the frozen water table and drain back into the historical Beaverhill Lake bed. This could be why there is water back in Beaverhill Lake in 2017.

Interestingly enough, even though 2017 seemed to be the "high water year" in comparison to 2016, looking at the Environment Canada Shonts Weather Station data, we can see that in reality it was 2016 that was the high year with an added 136.4mm more precipitation then in 2017 (Agriculture Alberta, 2017).

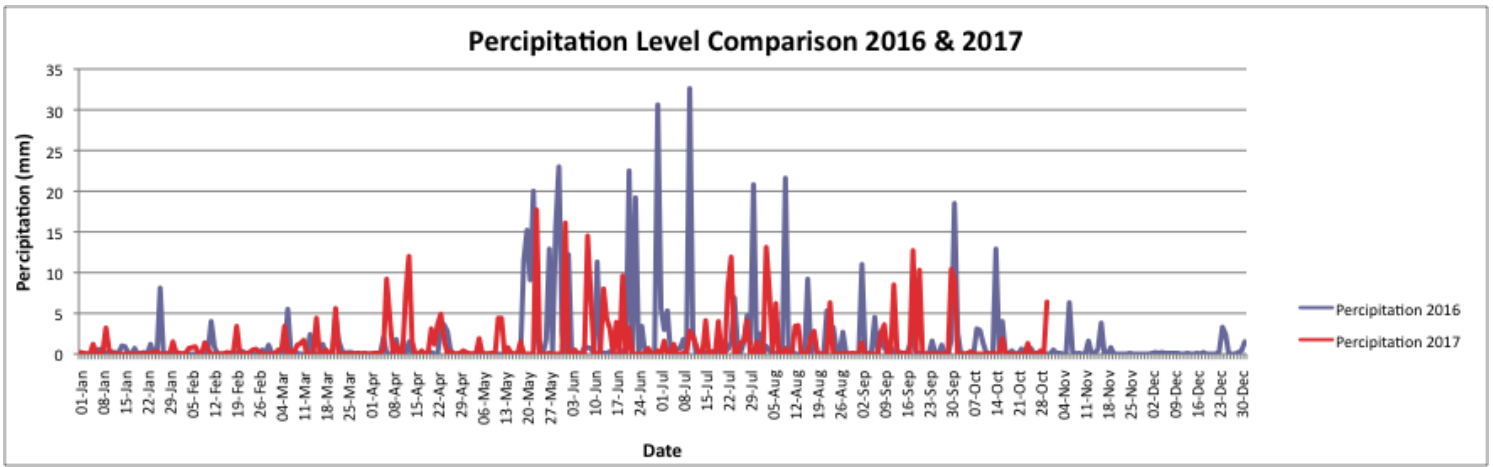

Figure 1. Precipitation Level Comparison for 2016 & 2017

With the high water levels that have been documented this year, a number of species have been recorded for the first time in many years along Beaverhill Lake by BBO Staff and visitors. This year there was a confirmed sighting of local breeding Virginia Rails out at the weir. They were observed on the mud flats that formed for a couple of months along the southeast shore of Beaverhill Lake.

These high water levels could be the start of the return of Beaverhill Lake, which would greatly impact and change the waterbird diversity. Already in 2017, during the spring migration, BBO staff saw a huge spike in the number of Clay-colored Sparrows captured compared to previous years. This could be due to the flooded lakebed forcing the Clay-colored Sparrows to migrate along the shoreline instead of flying straight across the dry lakebed. Also, with the return of water, we would potentially see the number of shorebirds and waterfowl increase back to their historic numbers of thousands, like back in the 1920s and 1940s (Lister, 1976).

Conclusion

In conclusion, it seems that the amount of precipitation that has fallen over the Tofield and surrounding area over the last two years is leading to encouraging signs that Beaverhill Lake might be returning. High water levels have been documented in the fall of 2016 and water remained in the lake for the duration of the 2017 season. With above average precipitation over the upcoming year Beaverhill Lake may well return to support the thousands of waterfowl and other birds that are attracted to this vast wetland ecosystem.

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Literature Cited

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Agriculture Alberta. 2017. Current and Historical Alberta Weather Station Data Viewer. (2017). Retrieved November 01, 2017, from https://agriculture.alberta.ca/acis/alberta-weather-data-viewer.jsp

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Appendix 1

The following are photos taken from April 1st until November 1st, 2017. They were taken in 7 to 15 day intervals.


April 1, 2017


April 12, 2017


April 25, 2017


May 7, 2017


May 14, 2017


May 25, 2017


June 6, 2017


June 21, 2017


June 30, 2017


July 12, 2017


July 23, 2017

August 9, 2017

August 23, 2017

September 6, 2017

September 15, 2017

September 27, 2017

October 6, 2017


October 22, 2017


November 1, 2017