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Crowe Valley Conservation Authority
Watershed Management Message for Kasshabog Lake
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Background

The coordinated approach to watershed management was established in 1958 with the creation of the Crowe Valley Conservation Authority (CVCA). The CVCA's primary mandate then as it is now, is to mitigate flood damage by protecting people and their property through flood forecasting and warning, the operation of existing water control structures throughout the watershed, implementing a regulations program, and reviewing municipal planning documents. By actively engaging in these programs, the CVCA ensures a flood forecasting and warning service is effective and timely to assist and advise municipal officials, the general public and emergency services to take the appropriate and necessary steps during the various stages of a flood event.

The Crowe Valley Conservation Authority watershed management strategy is based primarily on the Crowe River Water Management Study – Dam Operation Manual and the Crowe River Water Management Study – Flood Forecast Manual. The two studies give the CVCA greater understanding of lakes, watercourses and water control structures within the Crowe River watershed, providing guidance for dam operations and water resource management activities. Using these studies coupled with a history 55 years of watershed management experience, the CVCA strives to balance the environmental, social and economic objectives for the entire watershed.

The Crowe Valley Conservation Authority's overarching goal is to maintain the viability of social, economic and environmental conditions in the watershed. The CVCA's first concern is to manage water resources in a way that provides the highest level of protection for the health and safety of residents and visitors, and to reduce damages to property from flooding. The CVCA also endeavours to achieve and maintain target water levels during non-flooding conditions in order to encourage and allow visitors and residents to the watershed alike to enjoy recreation on the water. Target water levels are also very important for the health of our lake and river ecosystems. The CVCA strives to maintain this difficult balance among various environmental, social and economic conditions while taking into account the uses and users that are affected by changes in water levels and flows.

This will provide watershed visitors and residents a water management system to not only mitigate flooding issues, but also help maintain targeted water levels during non flooding events and protect lake environments. The CVCA strives to maintain a balance among various environmental, social and economic conditions while taking into account the uses and users that are affected by changes in water levels and flows.

The broad overview of watershed management is very cyclical, with seasonal variations based on a number of factors, including, but not limited to storm events, variations in precipitation amounts, timing of weather conditions, evaporation, temperature, natural features surrounding lakes and water resource usage.

Briefly, the cycle is as follows:

1. Every fall, the dams are operated to lower lake levels (“the fall drawdown”) to provide an opportunity to create additional storage for the spring runoff.
2. As the snow and ice melt early in the spring, coupled with rainfall, the spring freshet uses this extra storage and the excess is released into the watershed.
3. Once the freshet is over, the lakes have been filled and staff begin the task of stop log replacement to maintain the summer target levels for recreation and tourism purposes.
4. The CVCA continues throughout the spring to operate dams to maintain lake levels as closely as possible to the targeted summer levels. This is accomplished by monitoring all of the water levels on dam controlled lakes in the watershed on a daily basis and making the necessary stop log adjustments.
5. The CVCA makes every effort to keep the lakes within their operating range for either the winter or summer levels.

Currently, there are 14 water control structures in the CVCA watershed which are either owned and/or operated by the Authority. There are also two hydro generation structures on the Crowe River, one of which is directly operated by the CVCA, while the second is operated independently. Neither hydro station is owned by the CVCA, but both are dependent on the direction of the CVCA based on water levels.

The Ministry of Natural Resources and Forestry owns 5 dams in the watershed and they are St. Ola, Kasshabog, Round, Paudash and Cordova dams. The CVCA has two operating agreements in place to manage 3 of the 5 dams on behalf of the Ministry. Paudash dam operations are under the direction of the CVCA and St. Ola is only operated minimally by the Ministry.

Kasshabog Lake Dam

The Kasshabog Lake dam was reconstructed in 1956. It controls the fifth largest lake in the watershed with a water surface area of 809 hectares (ha) (8,090,000 square meters) at the regulated summer water level. The average depth of water at this level is 4.72 metres and provides a storage volume of 3824 hectare meters (38,420,000 cubic meters).

The main control structure of the concrete gravity dam consists of a single spillway, which is 4.27 meters wide. An overflow weir exists on both sides of the dam. The total length of the dam is 21.21 meters. The dam was originally equipped with manual operated winches provided for removing and replacing stop logs. The dam is scheduled to be upgraded with an overhead gantry system to remove the stop logs. The logs are removed or added to adjust water levels as necessary.

As previously mentioned, target levels have been predetermined for winter and summer. The fall draw down process begins officially on the 15th of October each year with a target to be completed by the 15th of November. CVCA staff make every effort to reach these levels, however excessive rainfall received in the fall can easily change the timing when the level is attained.

Further stop log removal may be required in the spring to allow for the passage of the spring freshet. The replacement of stop logs to achieve the regulated summer water level on the lake will be dependent on a number of factors. First and foremost, the size and duration of the spring freshet will always be the primary consideration, followed closely by rainfall and the timing of the rain (current, anticipated, how much seasonal rain has been received versus the average). However, staff will also have to take into account ground water conditions, wetland storage capacity, short and long term weather forecasts and current weather patterns.

Water levels are monitored remotely via a staff gauge located at 502 Fire Route 75, Lot 14, Concession 5, Havelock-Belmont-Methuen Township. In addition, two manual gauges are used by staff should the remote gauge require resetting due to power outages. Levels are recorded daily by staff, 365 days a year.

Spring/Summer Lake Levels

During the fall/winter of 2017/18, 3 stop logs were removed in preparation for the spring freshet. Typically there is one winter thaw, usually in January. This year, the thaw occurred in late February and could almost have been considered the spring freshet, especially since snow pack had been significantly reduced. However, additional precipitation, especially the ice storm in April replenished much of what had melted and with rainfall received in late April, a flood warning was issued for the entire watershed.

Immediately after the spring freshet, the Kasshabog lake level did begin to recede quickly. In an average year, there is usually a slower rate of decline on the lake with accompanied variations in the levels. Not so this year and CVCA staff recognized the developing trend, replaced all of the stop logs and jacked the bay. While these efforts were taking place, a number of residents/cottage owners voiced their concerns to the CVCA that Kasshabog was too low. When there is a noticeable difference on the lake, these calls (and others in past years) confirm the conditions on the lake. In essence, collectively, the calls are similar to a neighbourhood watch or as in this case, a “lake watch”.

With the stop logs in place early in May, almost two months of anticipated (and then realized) rain has enabled the lake to consistently edge higher. As of today, the lake is very close to the historical average heading into the summer recreational season.

The June 19th 2018 reading is 262.260m (Geodetic Survey of Canada Datum)
The average reading for June since 1990 is 262.249m

Therefore, at this point in time, Kasshabog Lake is slightly higher than the average by 11 millimeters. This can be largely attributed to jacking the dam early in the spring and more importantly, receiving enough rainfall to raise the lake. Our closest rainfall gauge has recorded 163.8 mm (approximately 6.5 inches of rain) since the dam was jacked in early May. The amount of rain in this period corresponds closely to the combined historical May and June averages for Peterborough of 150mm.

(source: The Weather Network theweathernetwork.com/forecasts/statistics/precipitation/cl6166418/caon0536)

Kasshabog Lake Summer Outlook

At this time, Kasshabog Lake has rebounded to the June average. If the averages for precipitation continue throughout the summer months, the lake level for Kasshabog should remain close to or be at lake level averages. However, as always, other factors have to be taken into consideration as well. Temperature, evaporation rates, usage, timing of rainfall received will all contribute to the lake level over the summer and into autumn.

It appears if trends continue, periods of dry weather will be followed by storm events, which seem to be intensifying as each year passes and the effects of climate change take hold. Of course, storms are unpredictable and often are hit and miss propositions.

Typically, the CVCA strives to maintain a buffer by keeping the water level as high as possible in the summer. Staff at the CVCA will certainly endeavour to do our part and ensure the dam is sealed as well as possible and only remove stop logs if the water level exceeds the summer level range.

As always, if you have concerns or would like to discuss water levels or any of the CVCA's programs, please do not hesitate to call or e-mail either myself or any of the CVCA staff.

Enjoy your summer!

Tim Pidduck
General Manager/Secretary-Treasurer
Crowe Valley Conservation Authority
