

## Cedar Lake 2023 Hydrology Report: Executive Summary (4-8-24)

The Cedar Lake Hydrology Report presents the technical results of the 2023 Cedar Lake water level monitoring program ongoing since 2004. The purpose of the long-term program is to understand the critical management needs and influences toward supporting year-round desired in-lake water levels. Maintaining desirable summer-month water levels in Cedar Lake is a function of several physical and climactic factors influenced by targeted management strategies. Monitoring data from 2023 continue to demonstrate benefits of implemented strategies bolstering water retention in the northwest cedar swamp throughout the year. Activities include periodic railroad culvert cleanouts since 2014, wetland enhancement berm construction in 2017, Sherman Creek instream grade structures built in 2019 and the Jones Ditch culvert replacement. Water level monitoring provides vital understanding for identifying how these and future water level management options will benefit the lake.

### 2023 Water Level Monitoring Program Results

Precipitation, winter snow melt, groundwater losses, and evaporation remain the dominant factors that influence Cedar Lake water levels throughout the summer. For 2023, the average lake level observed was the highest since 2019. This average level was within four inches of the legal lake level (608.2), with variations remaining well within one foot of this elevation all summer. A wet Spring, higher than average summer precipitation, and noted watershed flow enhancements to date, supported 2023 lake level stability.

The wetland berm continues to successfully limit watershed outflow losses at the King's Corner culvert. These have dropped from 20% typical average losses to 2%. Sherman Creek instream grade structures influence spring-time water retention in surrounding wetlands, further influencing groundwater storage and permanent redirection of flow to Cedar Lake. Data from 2023 also continue to show significant surface water flow improvements to the lake during wet-weather events from Jones Ditch following 2018 culvert replacement at West Cedar Lake Road. Improved beaver management above the Jones Ditch culvert appears to have helped timely release of surface water flows by late 2023.

With three years of lake level data post-construction of the new outlet, 2023 observations may now suggest a shift in factors most influencing summer water level conditions. These relate to more rapidly reaching legal lake level than typically encountered with the previous outlet structures. Potential shifts in seasonal conditions will be carefully analyzed with continued monitoring to determine how and if these might influence future lake level management efforts.

Planning and coordination by the CLIB and K&A will continue to monitor these and other emerging trends within the watershed, and consider engineering designs to address these as appropriate. Report recommendations for the 2024 monitoring program and related analyses include:

- 1) Consideration of additional hydraulic improvement options for Jones Ditch and contributing areas including improved maintenance and/or potential reconstruction of the northern-most railroad culverts to increase watershed flows.
- 2) Potential Jones Ditch channel reconfiguration and beaver removal/management activities upstream and downstream of the West Cedar Lake Road culvert to maintain and enhance surface water discharges to the lake during summer wet weather conditions.
- 3) Review of snowpack and spring-time wet weather conditions pre-/post-construction of the new outlet as well as related relationships with Sherman Creek and Jones Ditch actions to aid understanding how future lake level management actions will benefit lake levels.
- 4) Relevant support of potential options for artificial water returns to Cedar Lake with any re-construction of stormwater drainage improvements in Lakewood Shores.