Photo Credits: Tom Kovarik &
Joe Barten (throughout)

Lower Mississippi River Watershed Management Organization

Lake Augusta Next Steps

January 8, 2025 LMRWMO Board Meeting

Joe Barten

LMRWMO Administrator &
Dakota County SWCD Program Management Supervisor

LMRWMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

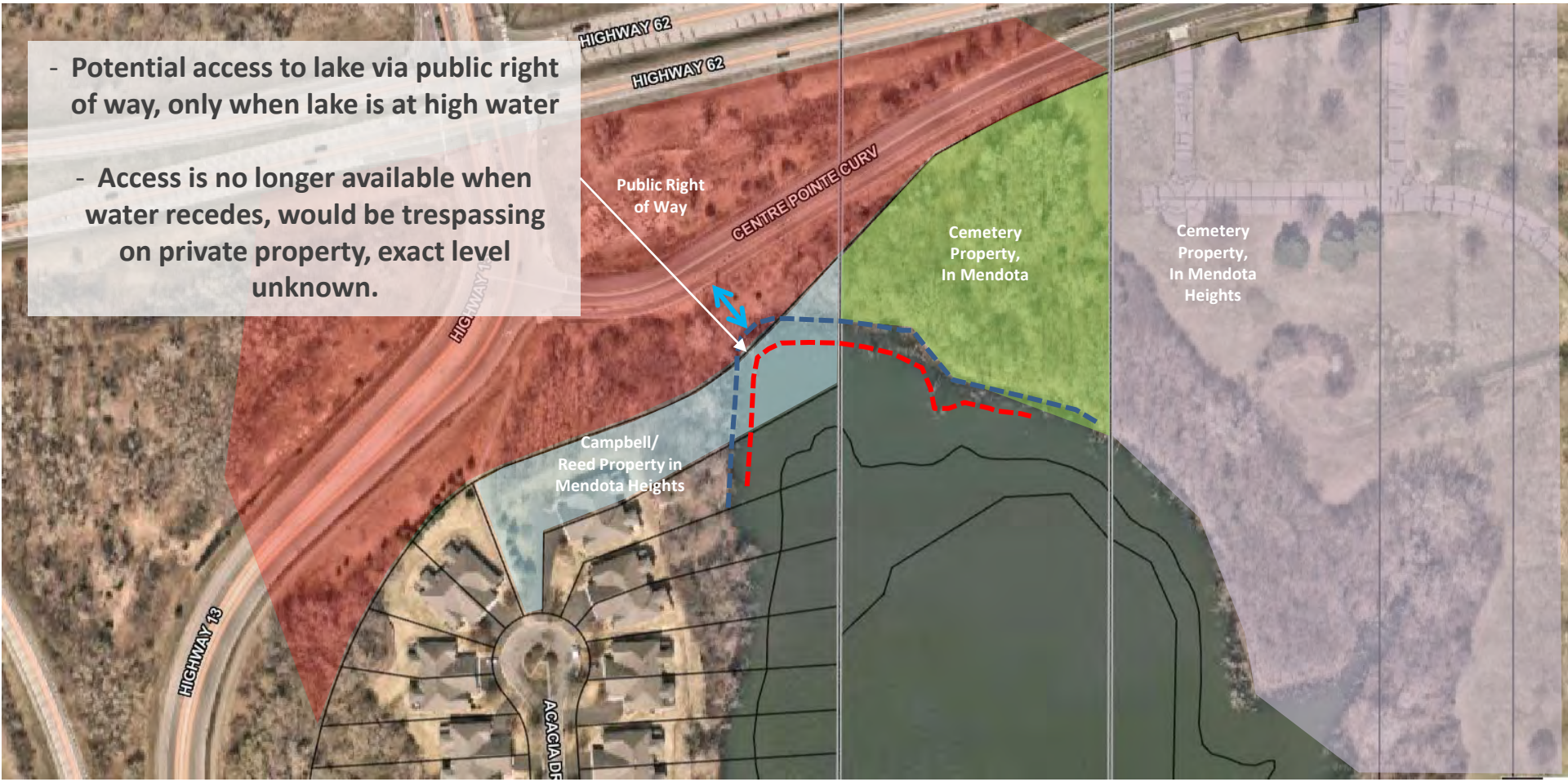
Orientation

LMR WMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

Property Ownership

LMR WMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

Ownership – Lake Augusta



Lake Stats

Lake Augusta Stats

- City of Mendota Heights
- 44 acre lake
- 420-acre watershed
- Deep lake: max 33 feet
- Land-locked
- Privately Owned
- Very steep slopes around lake

LMRWMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

WRAPS Study

2013 → 2017 → 2022 → 2023 → NOW

Lake Augusta

The period of 10/1/2007-9/30/2008 was determined to be the critical period for Lake Augusta. Internal loading of phosphorus accounted for 87% of the phosphorus budget to Lake Augusta during this period, with watershed runoff (11%) and direct deposition from the atmosphere (2%) accounting for the remainder of phosphorus inputs to the lake (see Figure 2.8).

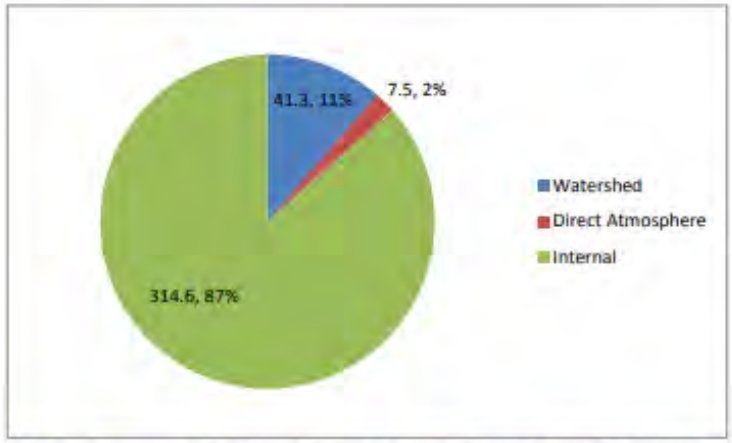


Figure 2.8 Lake Augusta Total Phosphorus (lbs) Contributions 10/1/2007-9/30/2008

LMR WMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

Aluminum Sulfate Treatment

2013 → 2017 → 2022 → 2023 → NOW

LMR WMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

Cormorant Impacts Considered

2013 → 2017 → 2022 → 2023 → NOW

Feasibility Study

2013 → 2017 → 2022 → 2023 → NOW

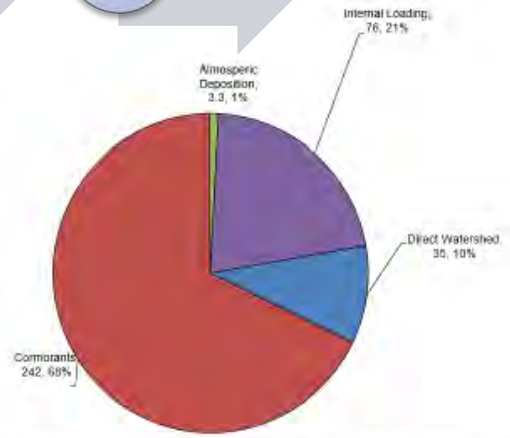


Figure 4-4 **Modeled 2022 Growing Season TP Sources (lbs,%) for Lake Augusta**

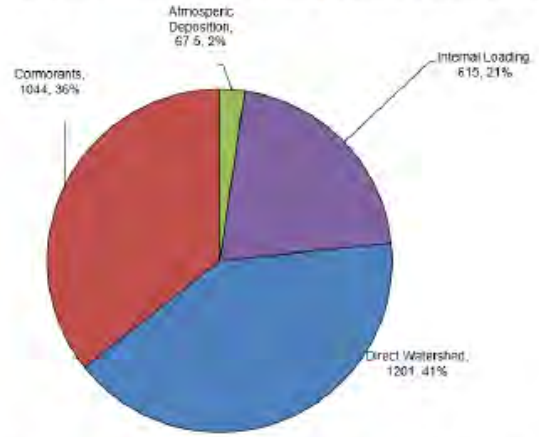


Figure 4-5 **Modeled 2013-2022 Annual TP Sources (lbs,%) for Lake Augusta**

LMR WMO
LOWER MISSISSIPPI RIVER
WATERSHED MANAGEMENT ORGANIZATION

Current Status

2013 → 2017 → 2022 → 2023 → NOW

November 2024 LMRWMO Meeting

- Barr Engineering provided a presentation on the feasibility study outcomes as well as a FAQ document

December 2024 LMRWMO Meeting

- Francie Cuthbert, PHD, a cormorant expert and recently retired professor at the UofM, presented on cormorants and their habits, habitat, migration patterns, population numbers, and management options.

Implementation Options

Based on the feasibility study and subsequent discussions and undetermined if implemented by the residents, City, or LMRWMO.

1. Pursue installation of a lake outlet.

2. Implementation of two upstream stormwater BMPs to improve water quality of stormwater entering Lake Augusta.

3. Removal of trees surrounding Lake Augusta to deter cormorants.

4. Further study of cormorants with the intent to either better understand, track, or manage the population.

Lake Outlet

1. Pursue installation of a lake outlet.

- Grant funding for an outlet is unlikely to be obtained. A similar outlet project at Seidls Lake (right) was funded with City obtained bonding funds.
- The desired future lake level would need careful consideration and input from residents.
- The exact benefit to lake water quality of a lake outlet on its own is unknown. There is an assumed flushing effect that an outlet provides long term, however the study assumed the outlet to be tied to reductions in cormorant populations, which may not be the case.
- If an outlet is implemented: Opportunities for water quality improvements in the watershed can be considered down the road, likely lead by the City, should they choose, but not until the multi-year effects of the outlet on water quality (after 5+ years of monitoring for example) indicate whether the outlet has had any impact on water quality.
- The LMRWMO can add monitoring of lake levels to its current monitoring to track over time and would stop if/when a lake outlet is installed.

Implementation Options

2. Implementation of two upstream stormwater BMPs to improve water quality of stormwater entering Lake Augusta.

- Grant funding is possible to pursue for the two stormwater BMPs.
- Private property permission would be needed for both BMPs to be possible to implement.
- The two BMPs provide future pollutant reductions, but do not address cormorants, the estimated larger contributor of phosphorus to the lake. Therefore, the efficacy of the stormwater BMPs to significantly improve water quality is unknown.

Implementation Options

3. Removal of trees surrounding Lake Augusta to deter cormorants.

- Grant the lake is unknown, may be ineffective, and/or may have funding is unlikely to be obtained for tree removal with private property surrounding lake.
- The impact on the cormorant population due to dead tree removal around lake is unknown, may be ineffective, and/or may have unintended consequences.
- The residents/private property owners can choose to lead the removal of trees either before or after an outlet.

Implementation Options

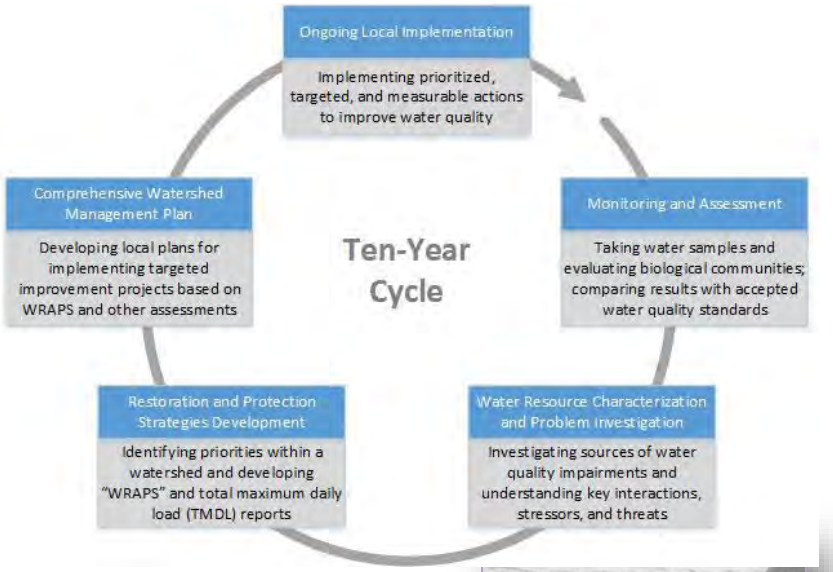
4. Further study of cormorants with the intent to either better understand, track, or manage the population.

- Further study of the non-nesting cormorant population may provide useful information for management, such as hazing, harassing, or culling, however it may have more limited use if management is not intended.
- Management of bird populations by a watershed management organization is uncommon, if not unprecedented, to improve water quality of a lake.
- The City, and/or Residents could pursue further study of the cormorant population, possibly a willing partner, such as the UofM could be found to lead such a study.
- The LMRWMO can reach out to the MPCA to identify when the next MPCA 10 year cycle comes up to gain awareness of timelines to possibly discuss a lake specific TMDL that accounts for the cormorant impacts.
- The LMRWMO can continue to monitor water quality as it has been to gather more data for future evaluations.

Water Monitoring

Continued Water Monitoring

- The LMRWMO can reach out to the MPCA to identify when the next MPCA 10 year cycle comes up to gain awareness of timelines to possibly discuss a lake specific TMDL that accounts for the cormorant impacts.
- The LMRWMO can continue to monitor water quality as it has been to gather more data for future evaluations.
- The LMRWMO can monitor water levels going forward on the lake to have a better long-term record.



LMRWMO Administrator Recommendations

Lake Augusta Recommendations

1. The City can choose to pursue a lake outlet at Lake Augusta. The LMRWMO would support the City in this effort, at the request of the City, via technical assistance, assisting in pursuit of grant funds, etc.

2. The residents/private property owners or City can choose to pursue and lead the effort for removal of trees either before or after an outlet is installed. Since the lake shore is private property, the LMRWMO role is more limited. The City can decide if they have a role and can request assistance from the LMRWMO. The LMRWMO would support the City in this effort, at the request of the City, via technical assistance, assisting in pursuit of grant funds, etc. Establishment of permanent native vegetation around the lake should be pursued along with tree removal.

3. The LMRWMO will add monitoring of lake levels to its current monitoring schedule, periodically during the growing season, until and potentially after a lake outlet is installed. If the lake continues to fluctuate, this data could help in planning a lake outlet. The LMRWMO will continue to monitor water quality as it has been, either via volunteers or paid staff to maintain a comprehensive water quality data set.

4. Opportunities for water quality improvements in the watershed can be considered down the road, likely lead by the City, should they choose, but not until the multi-year effects of the outlet on water quality (after 5+ years of monitoring for example) indicate whether the outlet has had any impact on water quality. The LMRWMO would support the City in watershed water quality improvement efforts, at the request of the City, via technical assistance, assisting in pursuit of grant funds, etc.

1. The City, Residents, or LMRWMO could pursue further study of the cormorant population. However, this would be with a limited budget and only if a willing partner, such as the UofM could be found to lead such a study. The aim of such a study would be to track the population of birds on the lake over many years and see if the population correlates to Lake water quality. It would also be to better understand the population in the event that residents would want to take on management. The LMRWMO will not take or lead any actions to manage the cormorant population. The LMRWMO can work with the MPCA to discuss a lake specific TMDL that accounts for the cormorant impacts, only when that comes up next in the MPCA 10-year assessment cycle