MINNEHAHA CREEK
WATERSHED DISTRICT
QUALITY OF WATER, QUALITY OF LIFE

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Title:	**Wetlands' Role in Watershed Management**
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Purpose:
At the November 6, 2025, Operations and Programs Committee (OPC) meeting, staff will provide an overview of nutrient cycling in wetlands, how wetlands have been traditionally understood and managed, and how new insights can be integrated into MCWD's data-driven approach to watershed management.

Background:
Wetlands are a dominant landscape feature within MCWD's upper watershed, comprising nearly 20% of the total drainage area contributing to Lake Minnetonka. These systems play a key role in the ecological health of the watershed by:

- Providing habitat for fish, waterfowl, and other wildlife
- Removing pollutants such as sediment and nutrients from watershed runoff
- Storing runoff to reduce the volume and rate of flow to downstream lakes and streams

Traditionally, wetlands have been regarded as natural treatment systems that improve water quality by capturing and retaining nutrients such as phosphorus and nitrogen. However, this assumption is being challenged by emerging evidence that long-term nutrient loading has fundamentally altered wetland nutrient dynamics.

MCWD's Wetland Monitoring Findings
Over the past decade, MCWD staff have assessed wetland nutrient cycling through subwatershed assessments, project design support, and project effectiveness evaluations. Data collected from a variety of wetland types show consistent patterns of dissolved phosphorus export, particularly from systems receiving long-term loading from developed or agricultural drainage areas. These findings suggest that while wetlands continue to provide stormwater storage and habitat functions, they may also be contributing to downstream nutrient enrichment.

These findings have already informed project planning in areas such as Six Mile Creek–Halsted Bay and Painter Creek, where wetlands once presumed to improve water quality were found to be nutrient exporters. This understanding is guiding MCWD toward more targeted wetland restoration and watershed nutrient reduction strategies.

Rethinking Wetland Restoration
Historically, wetland restoration has focused on in-wetland hydrologic and vegetative restoration by re-establishing natural water regimes and native plant communities within the wetland boundary. While these efforts have improved habitat and storage capacity, they have largely ignored the influence of upstream watershed inputs that may be driving degradation.

As a result, even hydrologically and biologically "restored" wetlands can continue to export phosphorus if their internal chemical and microbial systems remain saturated with legacy nutrients, or if excess nutrient loading from upstream areas continues unabated. True restoration, therefore, requires addressing external nutrient and sediment loading from the watershed and may require implementing in-wetland restoration to restore internal nutrient cycling processes.

This systems-based approach mirrors the way MCWD manages lakes and streams. For example, alum treatments to reduce internal phosphorus loading in lakes are only pursued if watershed nutrient sources have been reduced.

Similarly, in-stream restoration is implemented in conjunction with efforts to manage the watershed runoff that drives erosion. Wetland restoration must now evolve to follow this same approach: reduce watershed stressors and restore internal functionality of the wetlands.

Management Implications
These findings highlight a need to reframe how wetlands are viewed, managed, and restored within the watershed. Wetlands can no longer be assumed to provide net water quality benefits; instead, they must be assessed for their nutrient cycling condition and potential role as nutrient sources.

This evolving understanding carries several implications for MCWD's work:

- Integrated Watershed–Wetland Framework: Wetland restoration should address upstream sources of sediment and nutrients and pursue in-wetland restoration to restore internal nutrient cycling. This approach ensures that restoration investments are effective and sustainable, aligning wetland management with MCWD's lake and stream management approaches.

- Shift in Wetland Purpose: Wetlands should be viewed not as treatment systems for polluted runoff, but as natural systems that require protection from it. This represents a fundamental mindset shift—from using wetlands to protecting them—and underscores the importance of treating stormwater before it enters wetland complexes.

Next Steps
Staff from Project Planning and Research & Monitoring are collaborating to integrate these findings into watershed planning and project development. This includes identifying wetlands where restoration could improve nutrient cycling performance and developing management strategies that balance in-wetland restoration with watershed runoff to ensure that we can develop strategies to meet our goals of improving ecology, water quality, and hydrologic conditions throughout the watershed.

Summary:
Over the past decade, MCWD's investment in monitoring and analysis has expanded understanding of wetland nutrient cycling across the watershed. Findings indicate that many wetlands, once assumed to improve water quality, are now exporting phosphorus due to long-term nutrient loading and legacy accumulation. As MCWD continues to integrate these insights into its data-driven watershed management framework, staff are refining strategies to address both watershed loading and in-wetland nutrient processes.

At the November 6, 2025, Operations and Programs Committee meeting, staff will brief the Board on the District's evolving understanding of wetland function, discuss how these findings are shaping restoration and protection priorities, and guide discussion around the role of wetlands within MCWD's integrated watershed management approach.