

# Harvesting of Stream Sediment and Associated Phosphorus

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# Introduction

About half of agriculturally-derived phosphorus reaching the Yahara Lakes is associated with sediment, particularly fine-grained sediments resulting from soil erosion.



US EPA

# Introduction

The time required for sediment entering a stream to reach the lakes varies from hours to years to centuries, because

- Storms have relatively short durations;
- Flat stream segments trap sediment in small to medium events;
- Bridges create conditions that favor sediment trapping.

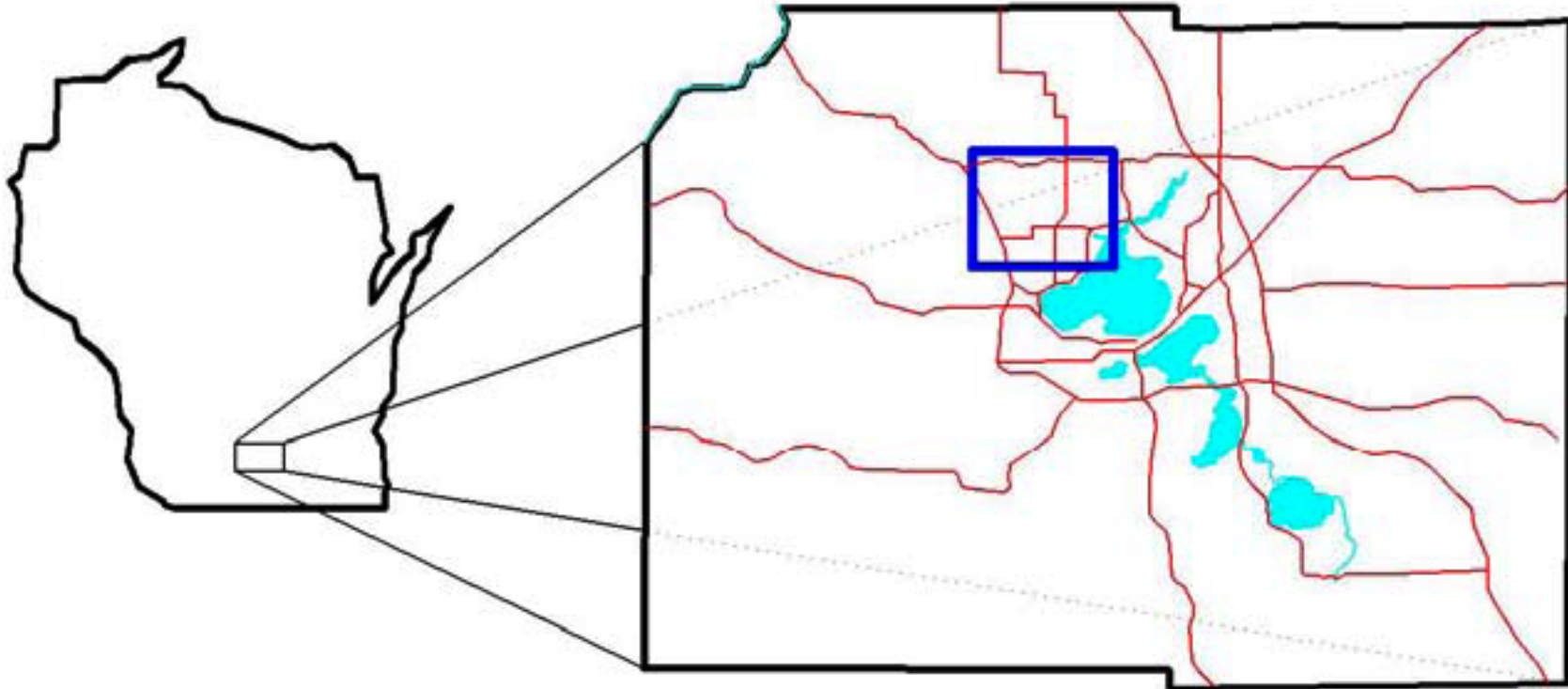


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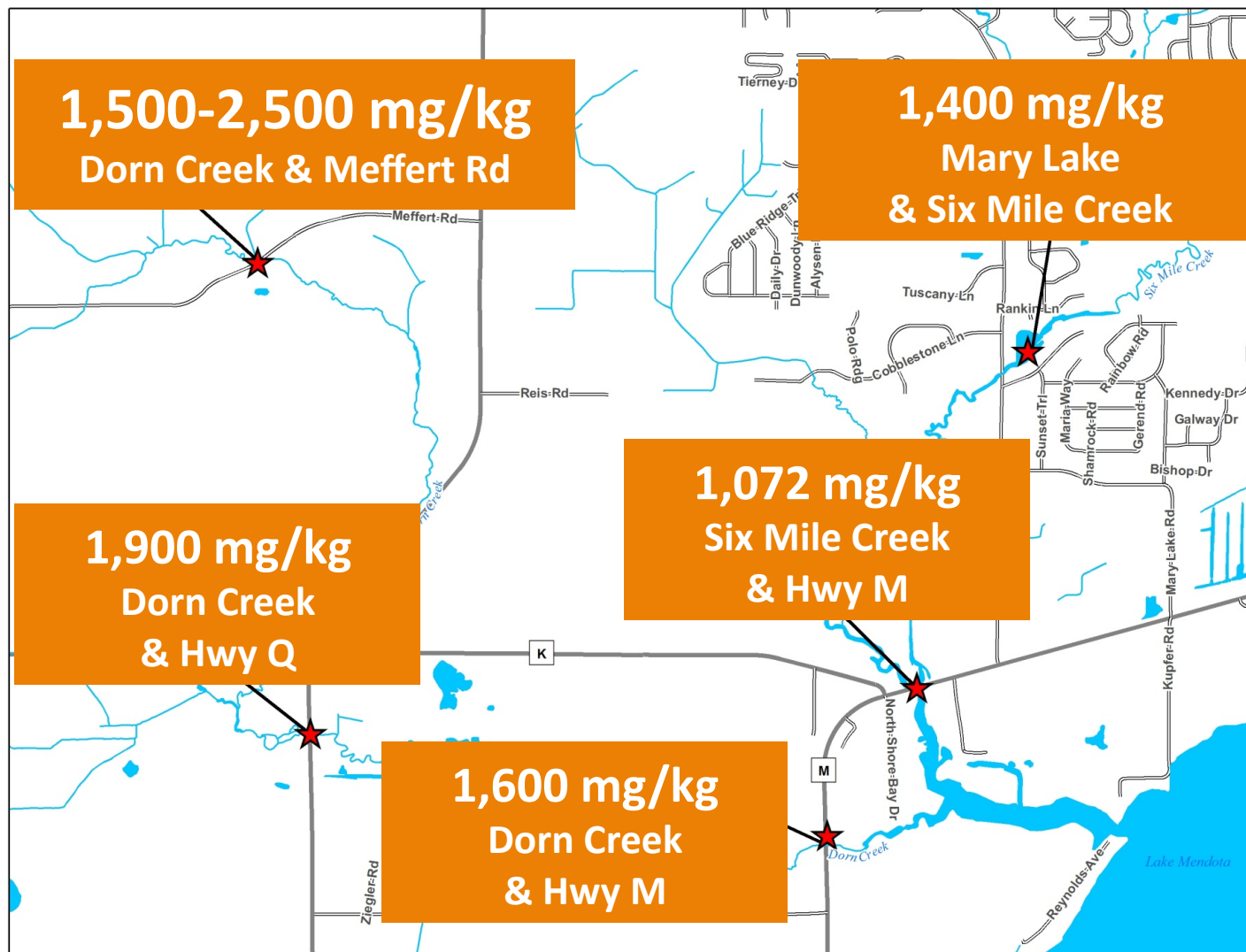
**Under what circumstances is it cost-effective to trap and remove sediment stored in stream segments?**

# A Case Study: Dorn and Six-Mile Creek Watersheds

*2013 UW-Water Resources Management Practicum*



# Sediment Harvesting Opportunities in the Dorn and Six-Mile Creek Watersheds



Total Phosphorus and Channel Sediment Results - Overview Map



# Sediment Harvesting via Wetlands

- In glaciated Wisconsin there are numerous wetlands through which streams pass.
- Research indicates that the streams are preferential locations for sediment trapping.



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# Sediment Harvesting from Wetlands

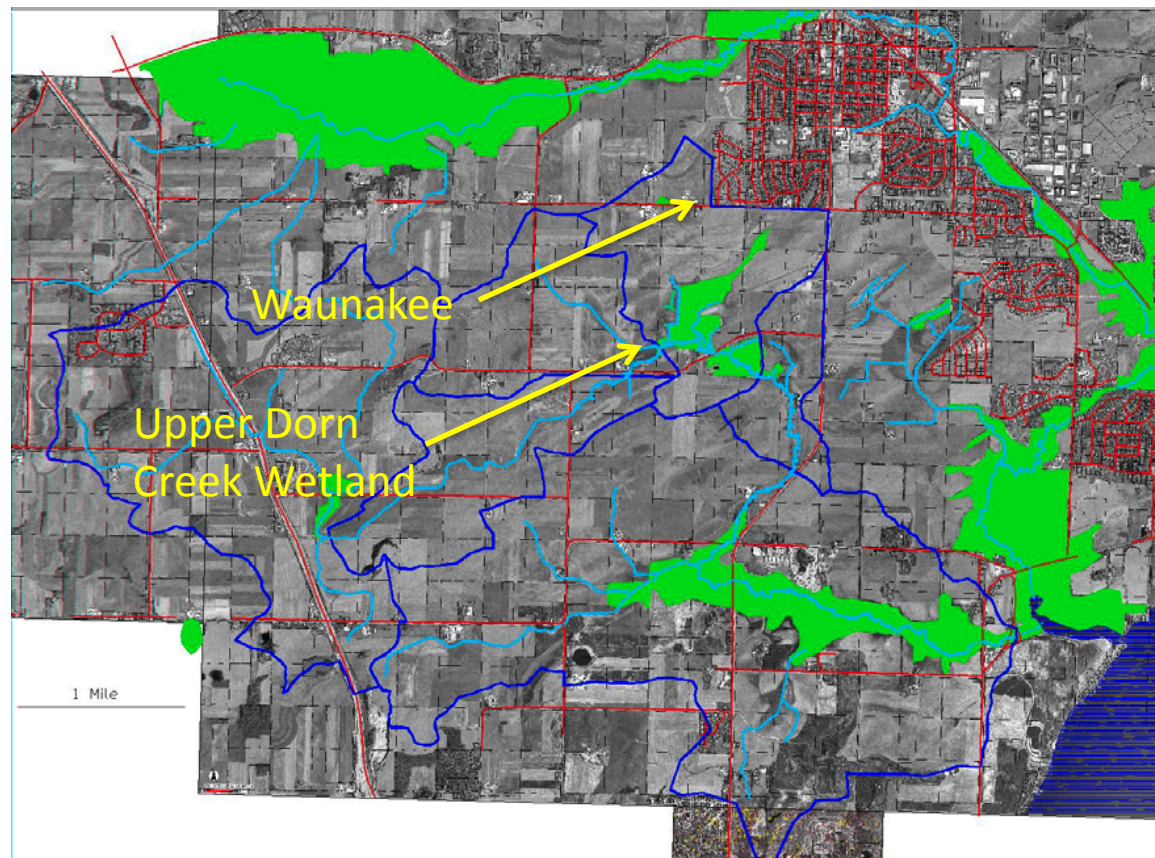
- Streams flowing through such wetlands overflow many times each year; however as sediment is trapped, the frequency of overbank flows decreases
- The *channels* flowing through wetlands only *temporarily* store sediment.



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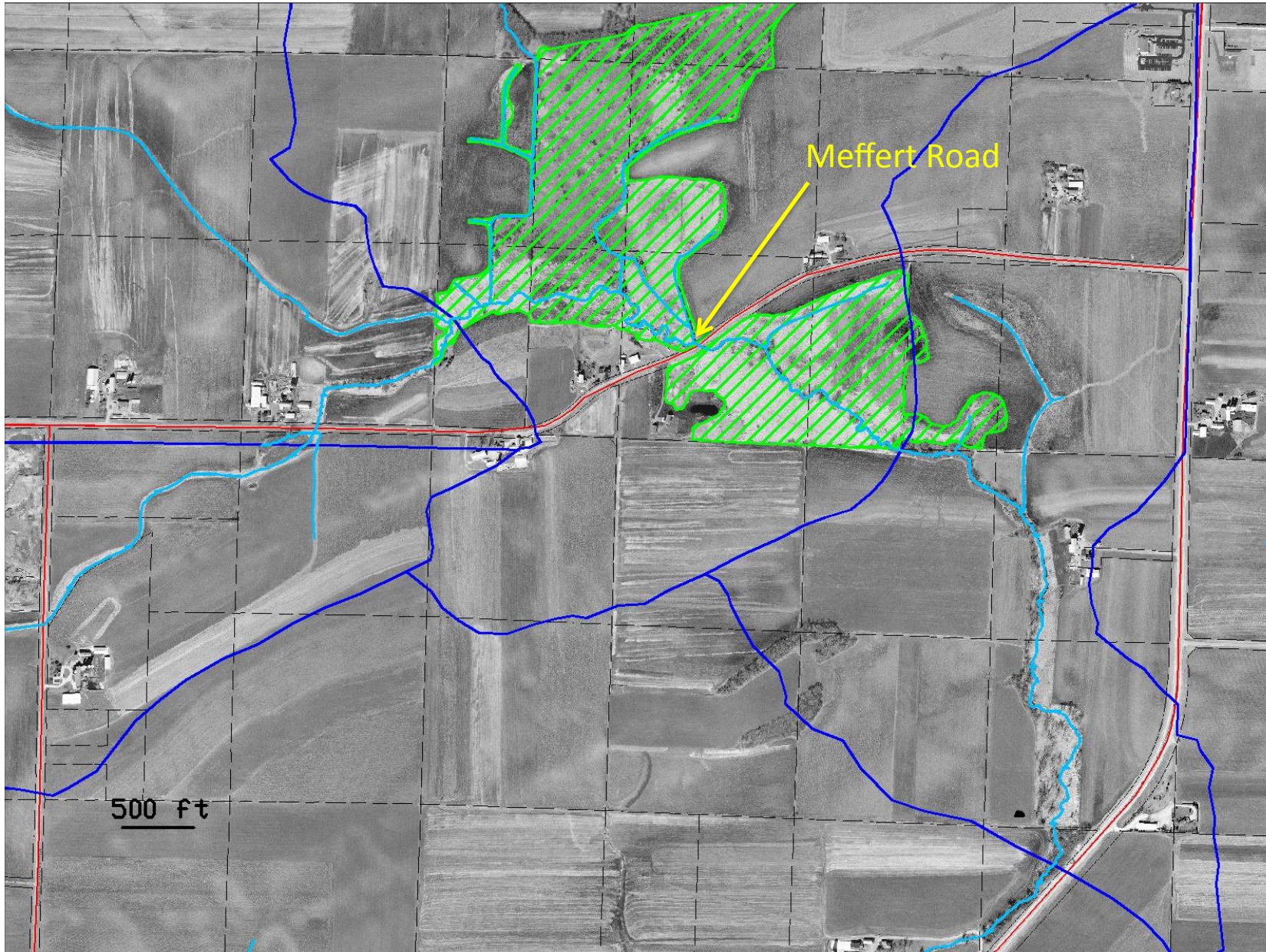


# 2013 Water Resources Management Practicum: Upper Dorn Creek Wetland





# Upper Dorn Creek Wetland



# Stream Restoration for Water Quality

Analysis by the **2013 WRM Practicum** has estimated that

- Removal of about a half meter of sediment from a **5-acre** portion of the Dorn Creek Wetland above Meffert Road would result in removal of about **300 lbs.** of phosphorus per year over a period of about **25 years.**
- Periodic removal of vegetation would enable removal of some dissolved phosphorus.



# Earlier Case Study: Pecatonica Floodplain Restoration

## Pre-Restoration



Eric Booth

## Post-Restoration



Eric Booth



# Pecatonica Floodplain Restoration



Eric Booth

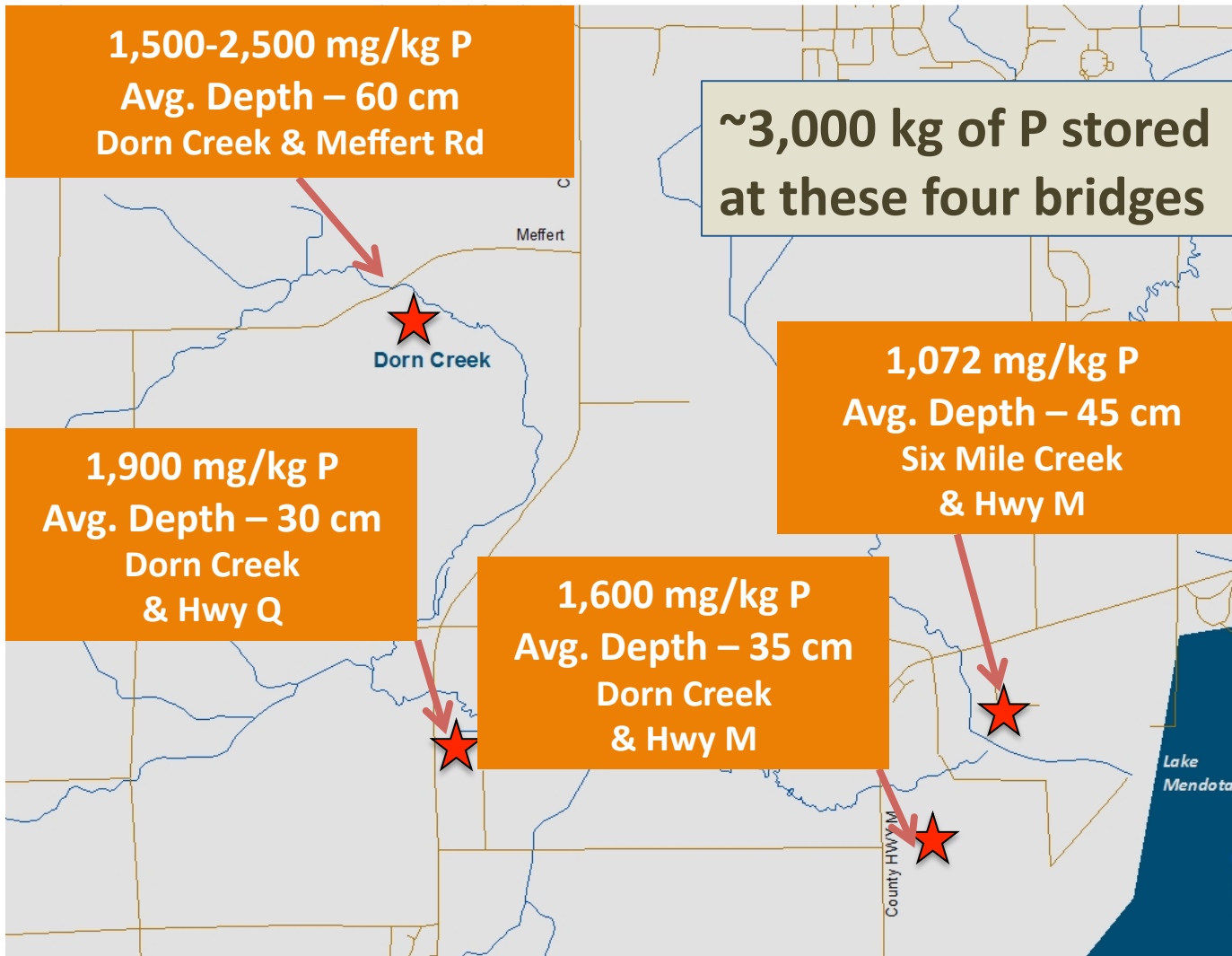


# Environmental Considerations

- “Restoring” natural systems to enhance sediment and phosphorus trapping is contentious.
- However, one could argue that such projects are simply restoring the ecosystem function of water quality improvement.

# Audience Participation

# Additional WRM Recommendations: Dredging at Bridges



# Sediment Removal at Bridges

- Good opportunity for reducing sediment/phosphorus transport to lakes
- New bridges could be designed to facilitate sediment/phosphorus trapping and removal.



# Additional WRM Recommendation: Mary Lake on Six Mile Creek

## Preliminary Estimates:

Phosphorus stored: 2,000 kg

P concentration: 1,400 mg/kg



WRM

**Questions?**