



Ox Creek TMDL

Work Plan Summary

Public Meeting
November 4, 2009
Benton Charter Township Hall



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Ox Creek TMDL Work Plan

Discussion Overview



USEPA Storm Water Pilots



Ox Creek



Salt Creek, Indiana



Minnehaha Creek, Minnesota



Work Plan Summary



Next Steps



TMDL Development

Problem Solving Framework



Practical approach using key questions ...



WHY the concern



WHAT reductions are needed



WHERE are the sources



WHO needs to be involved



WHEN will actions occur



Ox Creek



Ox Creek TMDL Work Plan

Phased Approach



Phase 1

- ☒ ***Watershed Characterization***
- ☒ ***Source Assessment***
- ☒ ***Linkage Analysis -- Initiate***



Phase 2

- ☒ ***Linkage Analysis -- Complete***
- ☒ ***TMDL Report***
- ☒ ***Implementation Strategy***



Ox Creek TMDL Work Plan

Phase 1



Watershed Characterization



Background Information



Problem Statement



***Water Quality Indicators
& Targets***



Data Summary



Ox Creek TMDL Work Plan

Watershed Characterization



Background Information



Setting



Government Units



Demographics



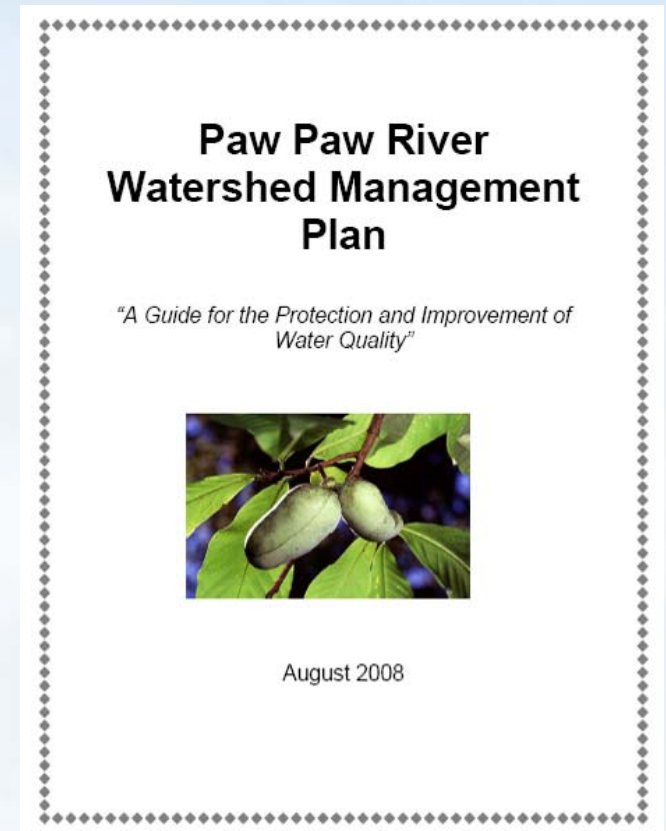
Land Use / Land Cover



Climate / Hydrology



Geology / Soils / Topography



Ox Creek TMDL Work Plan

Watershed Characterization



Problem Statement

- ✓ ***Not meeting Other Indigenous Aquatic Life & Wildlife designated use***
- ✓ ***Determined by poor macroinvertebrate community***
- ✓ ***Supported by exceedances of:***
 - ***water quality standards***
 - ***sediment quality guidelines***



Ox Creek TMDL Work Plan

Watershed Characterization



Water Quality Indicators & Targets

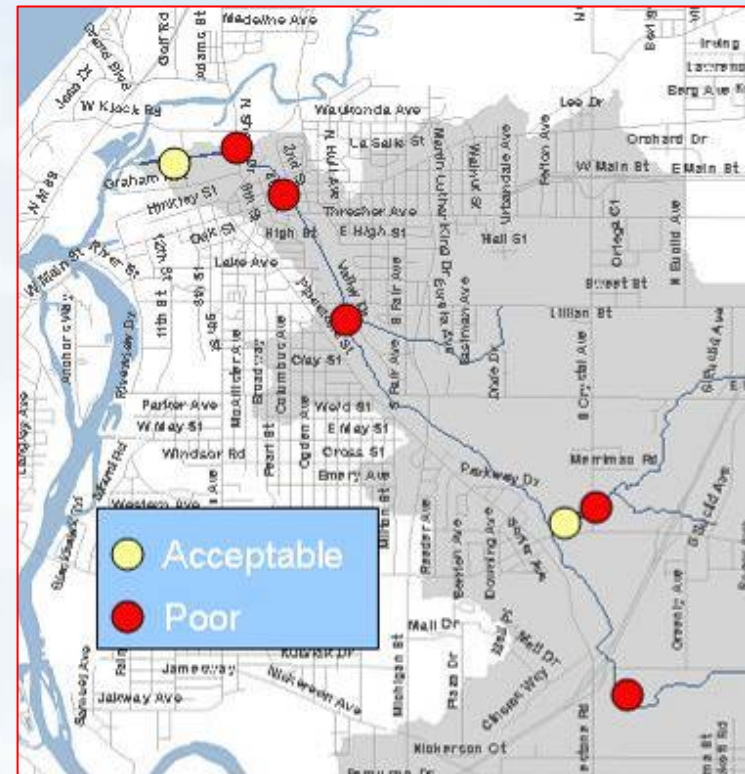


Macroinvertebrate scores



Water quality standards

Parameter	Chronic WQS (µg/L)	Acute WQS (µg/L)
Benzo(a)anthracene	2.6	46
Chrysene	1.5	46
Fluoranthene	1.6	28
Phenanthrene	1.4	9.4
Pyrene	2.5	45



Ox Creek TMDL Work Plan

Watershed Characterization



Data Summary



Biological Surveys (1969, 1976, 1991, 2001, 2006)



Sediment (2001 & 2006)



TSS Study (2007-08)

- Flow & Water Level



Caged Fish



Brownfield studies



Ox Creek TMDL Work Plan

Phase 1



Source Assessment



Source Data Review

- *NPDES Facilities*
- *Remediation Sites*
- *Leaking Underground Storage Tanks*
- *Land Use / Impervious Cover*



Storm Water Load Estimates



Ox Creek TMDL Work Plan

Phase 1



Linkage Analysis

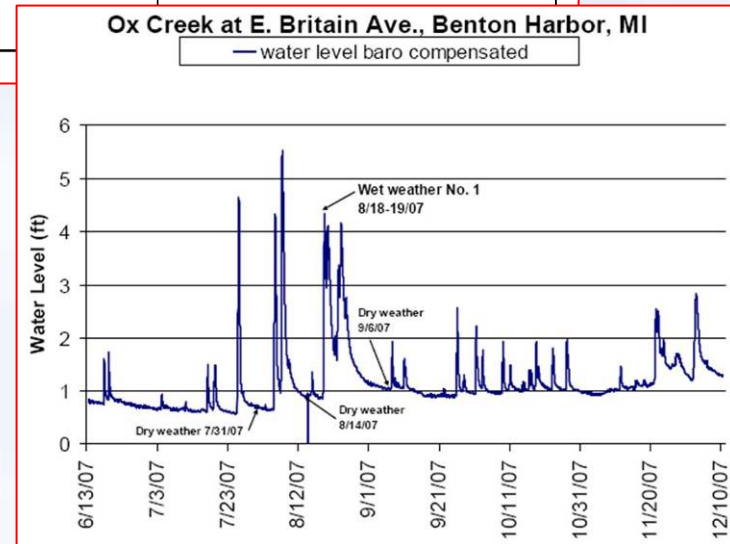
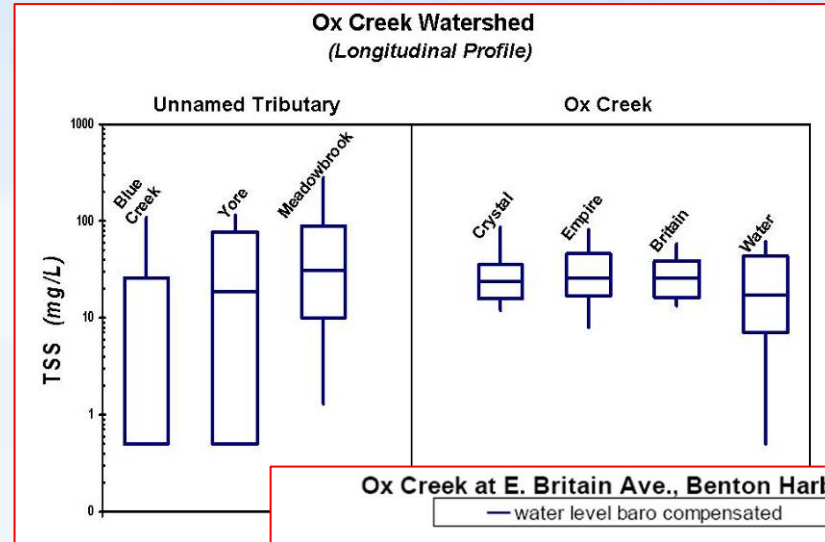


Connect the Pieces

- *Water Quality*
- *Hydrology*
- *Source Loads*



Examine Relationships



Ox Creek TMDL Work Plan

Phase 2



Linkage Analysis

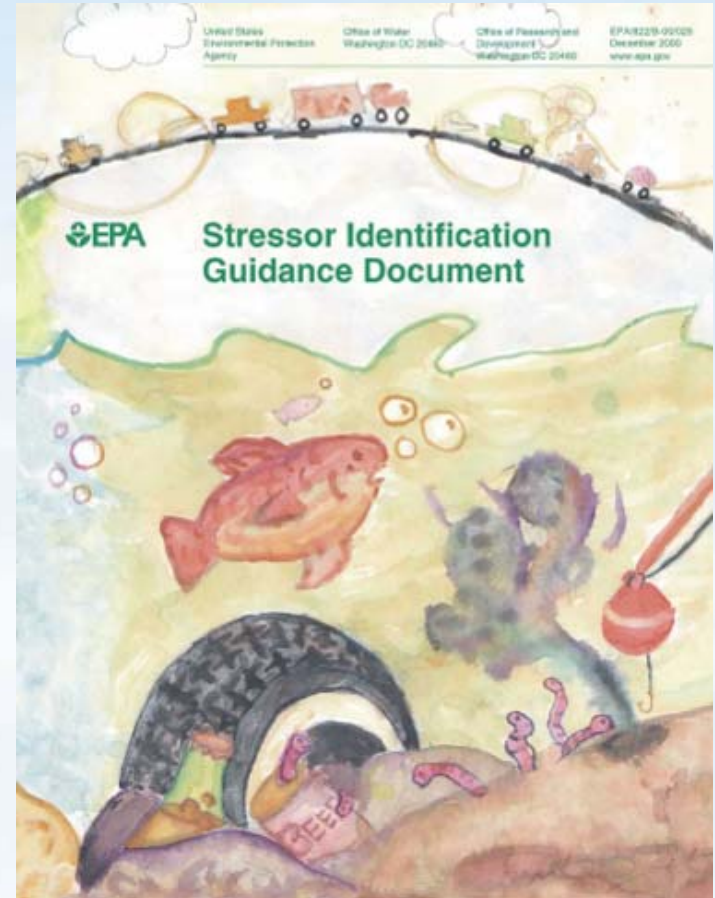


Stressor Identification



Examine Role of:

- ***Habitat***
- ***Sediment***
- ***Toxic Pollutants***
- ***Storm Water Hydrology***

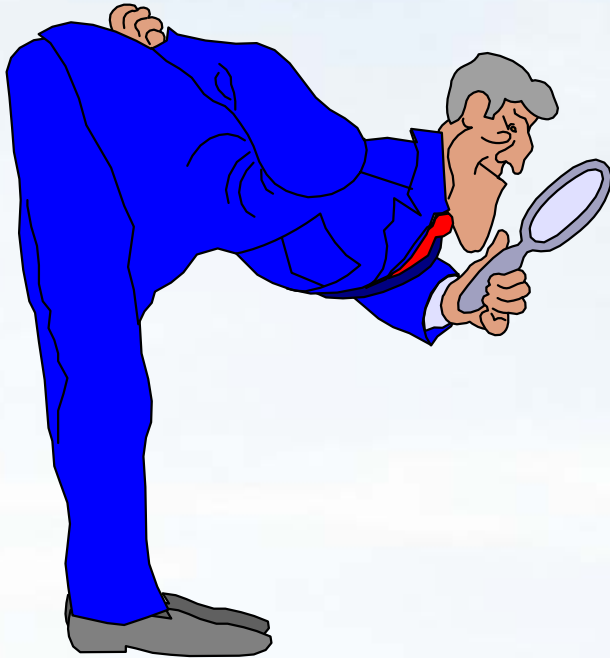


Ox Creek TMDL Work Plan

Phase 2



TMDL Report -- Required Elements



✓ Applicable WQ Standards

✓ Loading Capacity

✓ Source Assessment

✓ Allocations

✓ Seasonal Variation

✓ Margin of Safety

$$\text{TMDL} = \text{WLA}_{\text{Point Sources}} + \text{WLA}_{\text{MS4}} + \text{LA} + \text{MOS}$$

TMDL Development

Problem Solving Framework



Practical approach using key questions ...



WHY the concern



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Ox Creek TMDL Work Plan

Phase 2



Implementation Strategies

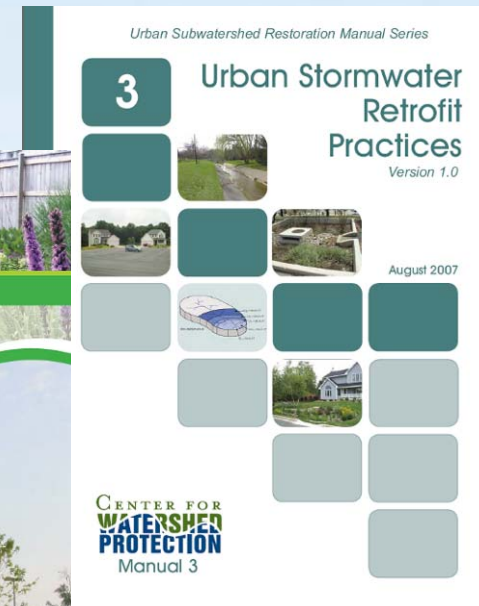
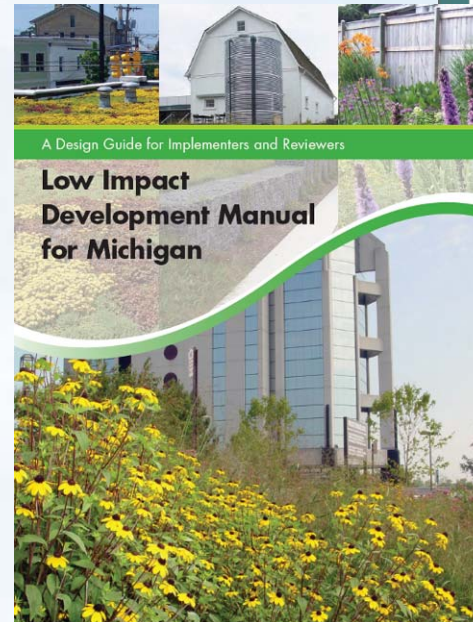


Storm Water Management



Program Coordination

- ***Local activities***
- ***State permits***
- ***Remedial actions***



Ox Creek TMDL Work Plan

Goal of Storm Water Pilots



Driving Principles



Technically-based (logic path)



Meaningful (easily understood)



***Value-added (connect to
implementation efforts
designed to solve problem)***



Ox Creek TMDL Work Plan

Next Steps



Questions



Feedback



**Additional
Information**



Ox Creek TMDL Work Plan

Next Steps



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