

# Plainwell Dam Removal on the Kalamazoo River:

## Removing More Than Physical Barriers to Restoration

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AOC Conference  
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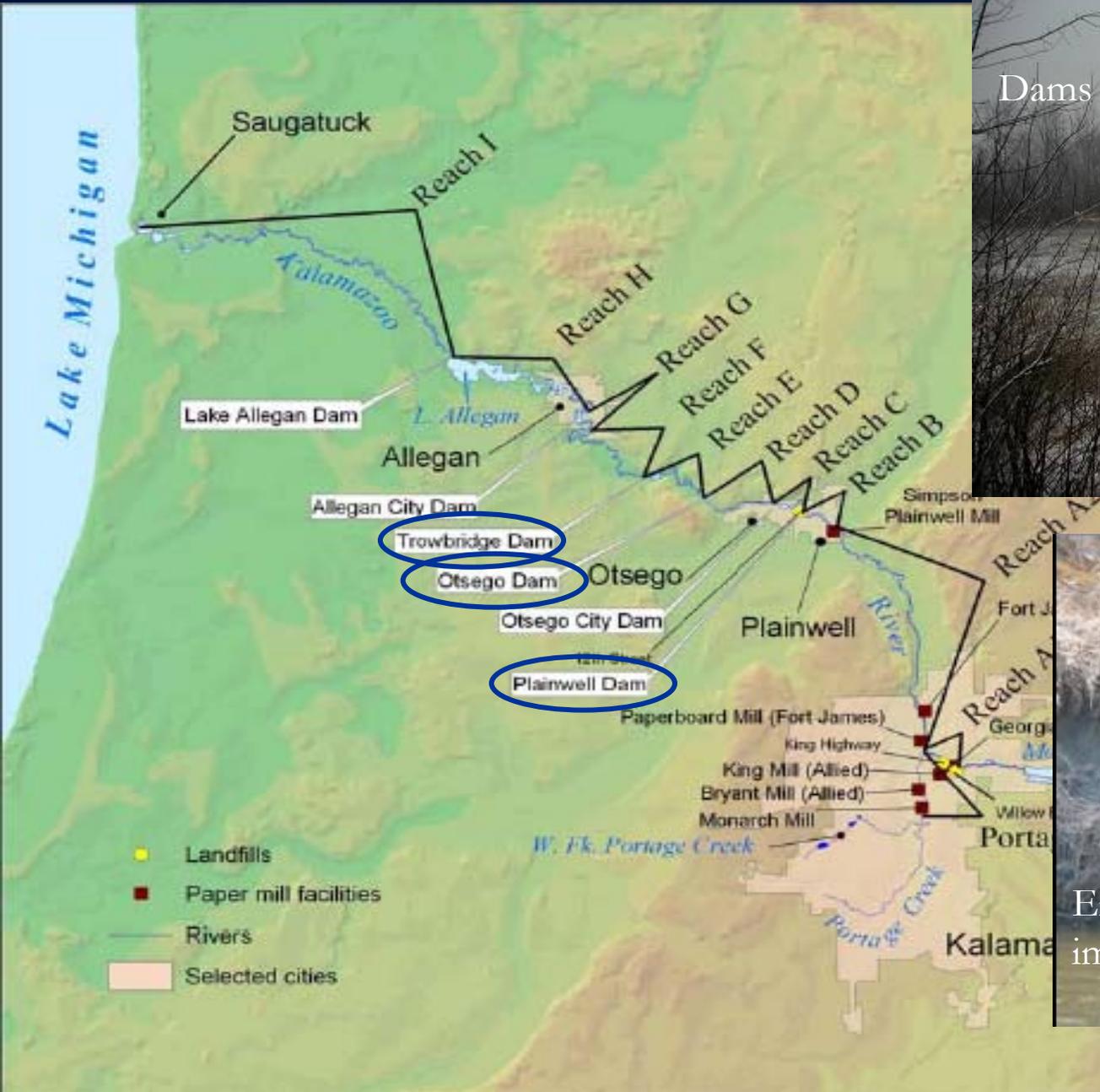


# Outline

- Project Background
- Challenges:
  - Combining restoration and remediation
  - Translating conceptual design to implementation
  - Understanding “stable channel”
  - Vegetation management
- Outlook



# State-Owned Dams Planned for Removal

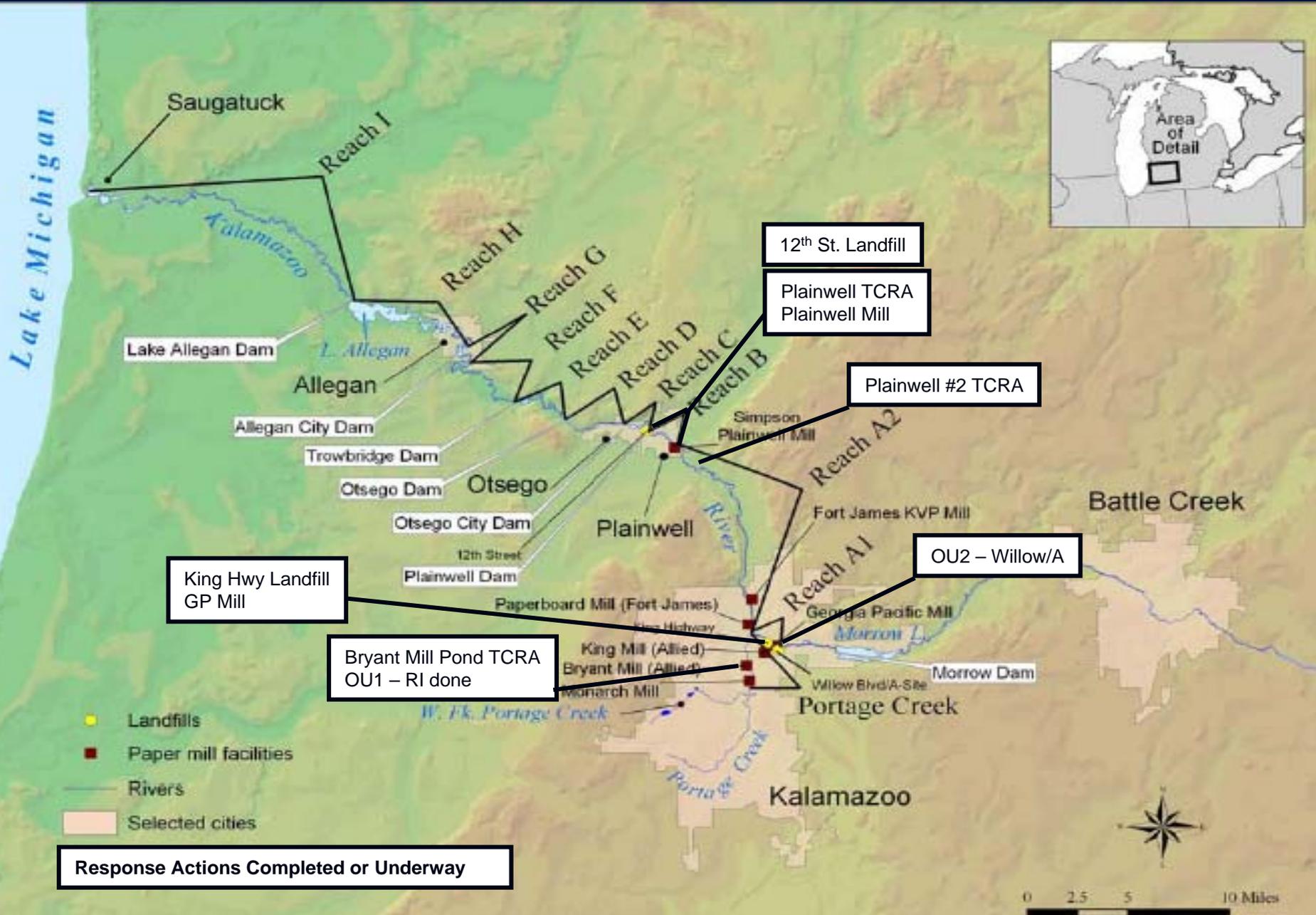


Dams built ~1900



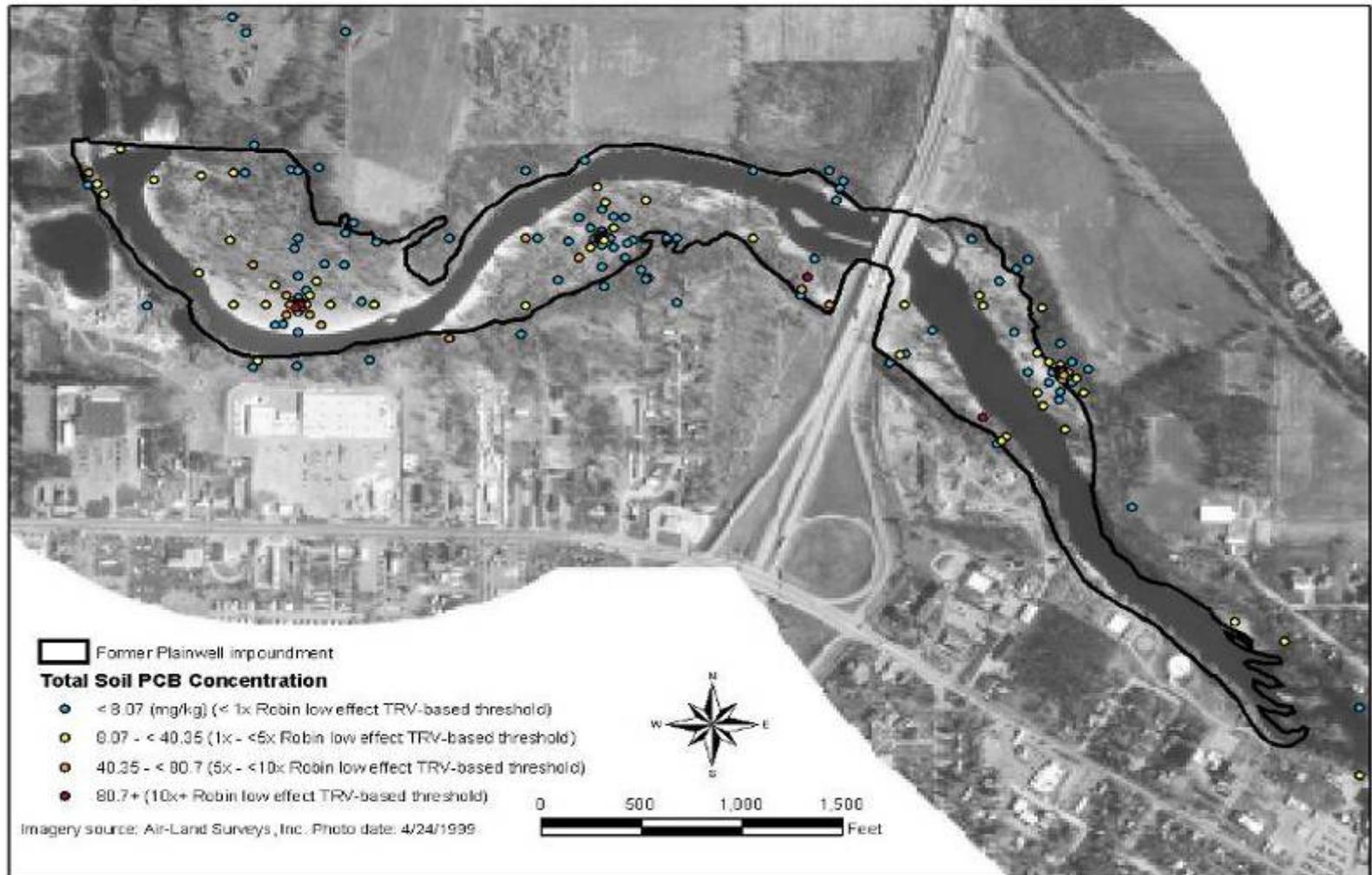
Eroding paper waste along former impoundments

# Superfund Site and Area of Concern



# Natural Resource Damage Assessment

Plainwell Impoundment:  
Surface soil concentrations compared to threshold for injury to robins



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# Challenge #1: Combining Restoration with Remediation

- EPA Superfund Program
  - Authorities
  - Preliminary alternative: keeping dams in place
- Paper companies
  - Preferred alternative: keep dams in place
- Kalamazoo River Watershed Council
  - Dam removal workshop
- MDNR Dam Owners and Natural Resource Trustees
  - Without PCBs, dams would have been removed



# Challenge #1: Combining Restoration with Remediation

- Facilitated Discussions
  - Confidentiality vs. public involvement
  - Building relationships
- Very large site
  - Fear of precedents and costs
  - Solutions:
    - Pilot removal project at Plainwell Dam
    - Process to move forward



# Challenge #1: Combining Restoration with Remediation

- Pilot removal project at Plainwell Dam
  - Remove sediments, banks and floodplain soils with greatest PCB concentrations
  - Replace dam with water control structure during excavation
  - Restore river to historical channel
  - Restore with native vegetation



# Emergency Mussel Relocation



# Flood During Construction

*Historic channel with water control structure*

*Spillway*

*Sheetpile to Excavate in "Dry"*

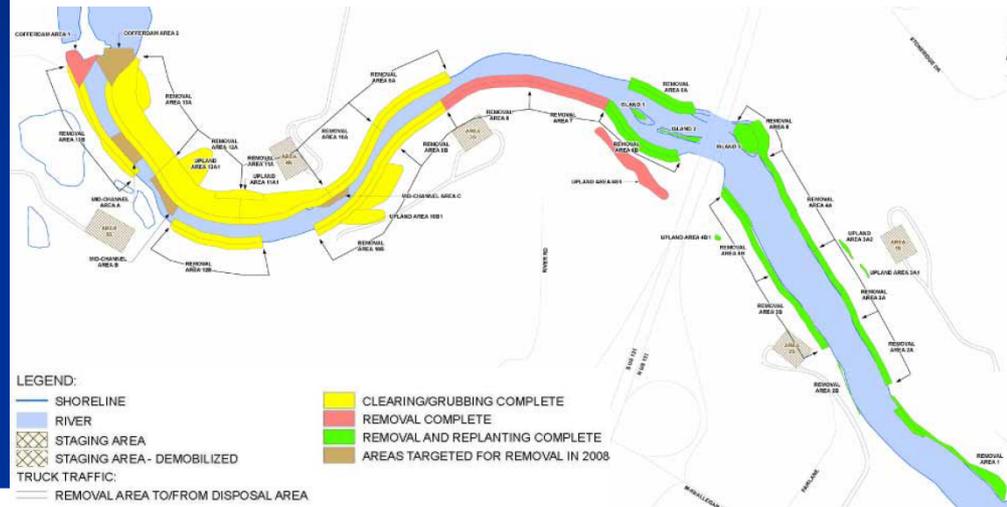
*Resuspension Controls*



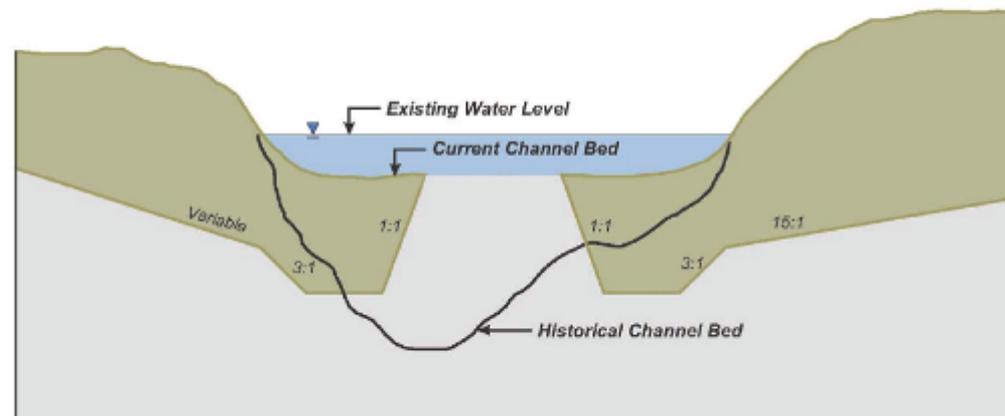
# Challenge #2: Translating conceptual design to implementation

- Excavation areas drawn based on sampling
  - Dynamic river system
  - Real-time sampling added
- Confirmation sampling required
- Plant lists based on predicted dam-out hydrology

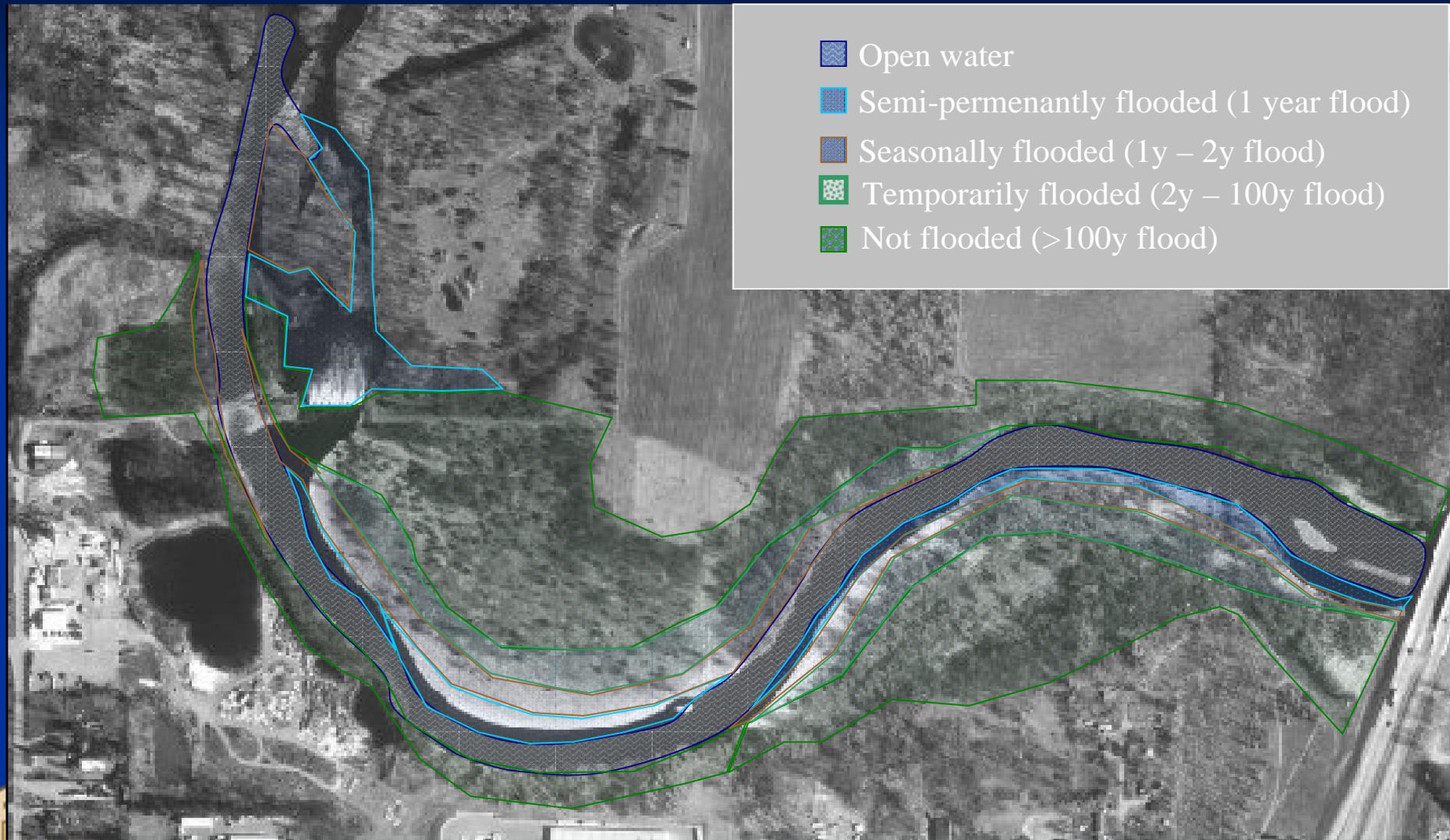
Plainwell TCRA –  
2007 Overview



## Neat Lines



# Water Regimes for Habitat Planning for Plainwell Impoundment



Outer project boundaries uncertain.

Based on visual interpretation of the MDEQ/CDM 2-year and 100-year floodplains (“eco-friendly” slopes; HEC-RAS results presented 8/3/05)

L. Williams 8-4-05



# Challenge #3:

## Understanding “stable channel”

- Engineers vs. Fluvial Geomorphologists
  - “Stable” = “Dynamic”
  - Rocks vs. vegetation
  - Timing critical
- Leaving contaminated material in place
  - Lowering water level helped, but clean fill needed in some areas
  - Need permanent markers



# Challenge #4: Vegetation Management

- Need to start immediately
  - Project engineers didn't start monitoring until end of construction (2 years)
  - Giant ragweed shaded plantings
- Need biologists available
  - Retirements, budget, oil spills....
  - Flexibility in management
  - Some non-natives interspersed may be OK
  - Some invasives must be caught early and controlled vigorously
- Consider irrigation, especially for trees and shrubs





June 2007



May 2009



August 2011





June 2007



May 2009



August 2011



# Outlook



- Monitoring banks & restoration
  - Short-term goals
  - Long-term goals
- Maintenance responsibilities
  - Paper companies first 3 years
  - Then MDNR