

# ZOAR LEVEE & DIVERSION DAM

Muskingum River Basin, Tuscarawas River, OH

## BASELINE CONDITION IN-PROGRESS PUBLIC MEETING

Huntington District

07 MARCH 2013



US Army Corps of Engineers  
**BUILDING STRONG**<sup>®</sup>



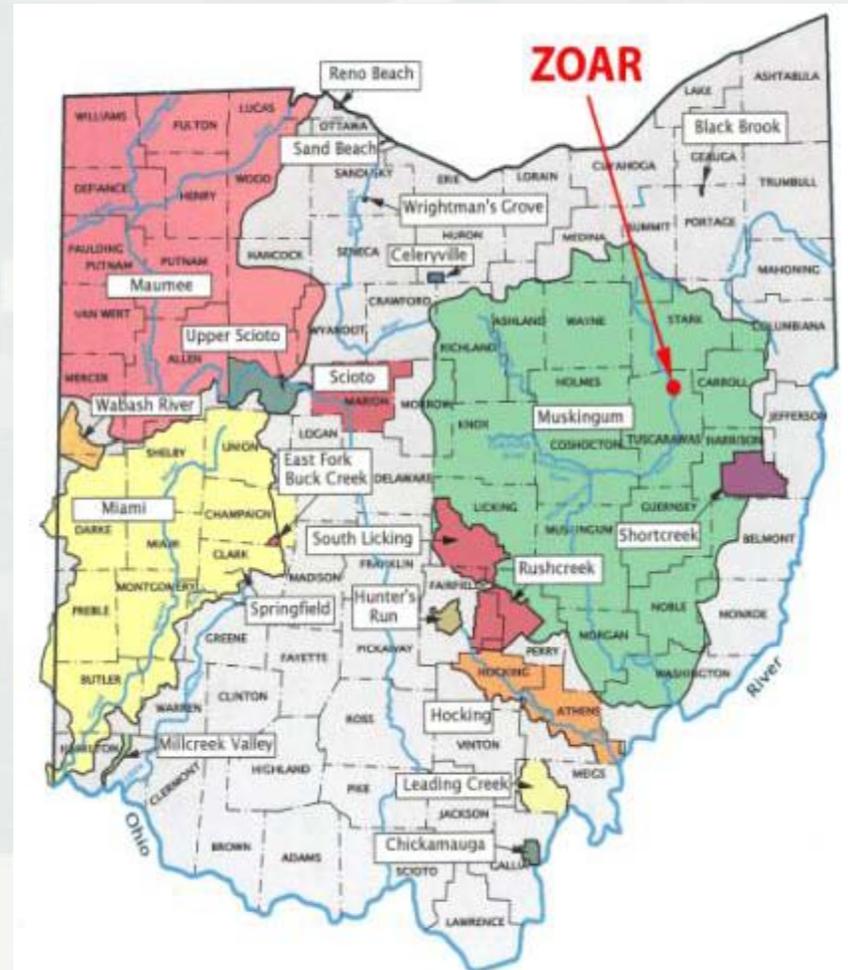
# MEETING PURPOSE

## ► Presentations

- Project Overview
- Overview of Study Process
- Summary of Status of Study

## ► Presentation & Workshop:

- Baseline Risk Assessment / Estimate
- Economic Baseline Data
- Habitat Baseline Data
- HTRW Baseline Data
- Historic Property Baseline Data
- Community Impacts Baseline Data



# APPURTENANT TO DOVER DAM



Dover Dam's Spillway Crest and Flowage Easement is EL 916'



# PROJECT COMPONENTS

BKGRD



# PROJECT PURPOSE



- ~169 People (2010 Census)
- ~98 Structures below EL. 916'
- Founded in 1817 by German Separatists
- Listed on National Register of Historic Places
  - Ohio State Memorial & Site Museum
    - Regional Heritage Asset
    - Nationally Significant Historical Site
- ~57 of the 98 buildings date from 1817-1899



# DIVERSION DAM PERFORMANCE ISSUES

1947



1978



1993



# JANUARY 2005 STORM EVENT



Dover Pool of  
Record, El 907.4

4 Week Duration



# MARCH 2008 STORM EVENT

Dover Pool EI 904.6  
4 Week Duration



# DAM SAFETY ACTION CLASSIFICATION

AS A RESULT OF 2008 STORM EVENT  
 ZOAR LEVEE & DIVERSION DAM: DSAC I

ER 1110-2-1156  
 DRAFT

**Table 31 USACE Dam Safety Action Classification Table\* 3 February 2009 version**

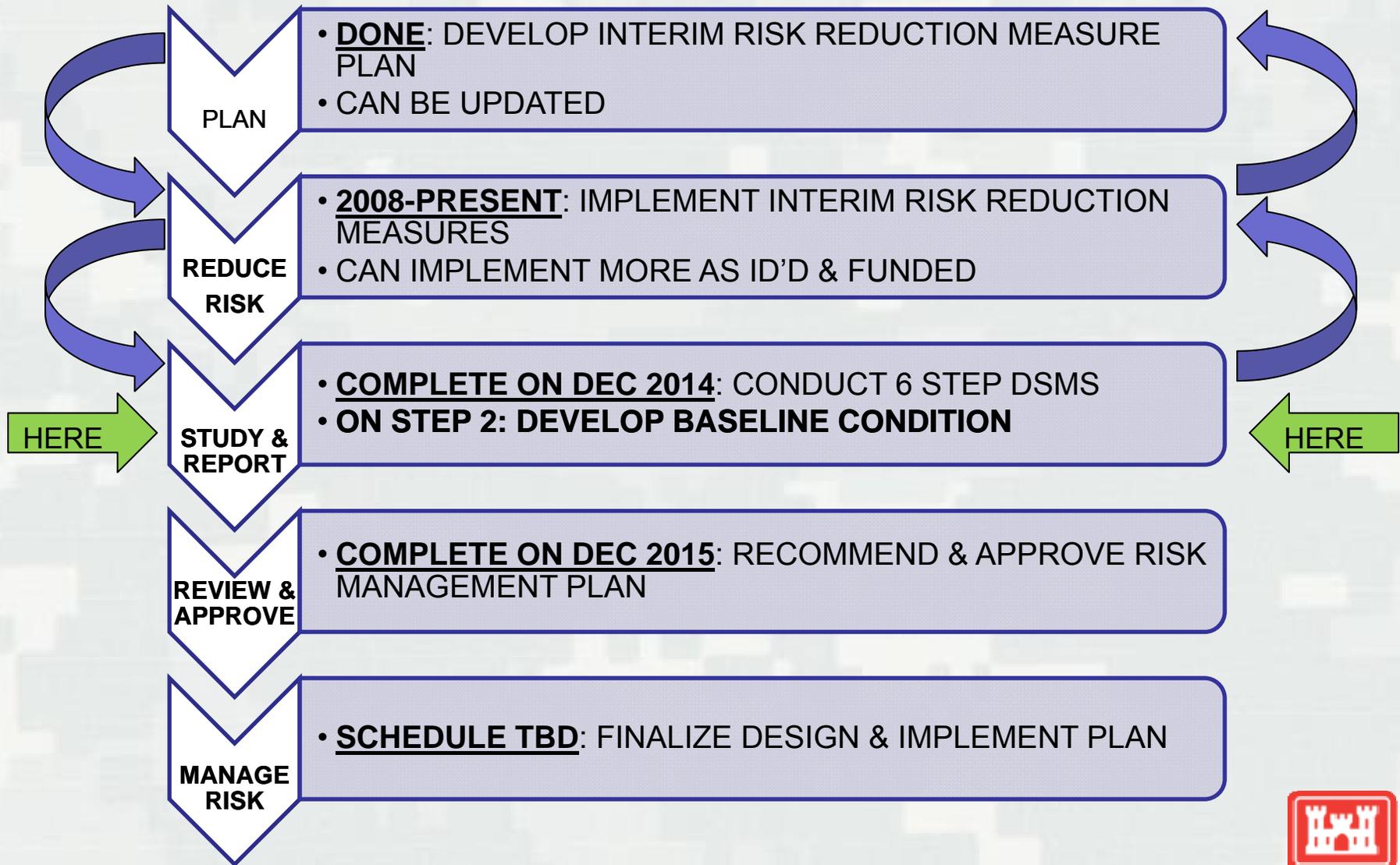
| Dam Safety Action Class                                      | Characteristics of this class   | Actions for dams in this class   |
|--|---|--|
| <b>I</b><br><b>URGENT AND COMPELLING</b><br>(Unsafe)         | <b>CRITICALLY NEAR FAILURE</b><br>Progression toward failure is confirmed to be taking place under normal operations. Almost certain to fail under normal operations from immediately to within a few years without intervention.<br><b>OR EXTREMELY HIGH RISK</b><br>Combination of life or economic consequences with probability of failure is extremely high  | Take immediate action to avoid failure.<br>Validate classification through an external peer review for dams with life loss concerns.<br>Implement interim risk reduction measures, including operational restrictions, ensure that emergency action plan is current, and functionally tested for initiating event.<br>Conduct heightened monitoring and evaluation.<br>Expedite investigations to support justification for remediation using all resources and funding necessary.<br>Initiate intensive management and situation reports. |
| <b>II</b><br><b>URGENT</b><br>(Unsafe or Potentially Unsafe) | <b>FAILURE INITIATION FORESEEN</b><br>For confirmed (unsafe) and unconfirmed (potentially unsafe) dam safety issues, failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety.<br><b>OR VERY HIGH RISK</b><br>The combination of life or economic consequences with probability of failure is very high. | Implement interim risk reduction measures, including operational restrictions as justified, and ensure that emergency action plan is current and functionally tested for initiating event.<br>Conduct heightened monitoring and evaluation.<br>Expedite confirmation of classification.<br>Give very high priority for investigations to support justification for remediation.  |
| <b>III</b><br><b>HIGH PRIORITY</b><br>(Conditionally Unsafe) | <b>SIGNIFICANTLY INADEQUATE OR MODERATE TO HIGH RISK</b><br>For confirmed and unconfirmed dam safety issues, the combination of life, economic, or environmental consequences with probability of failure is moderate to high.  | Implement interim risk reduction measures, including operational restrictions as justified, ensure that emergency action plan is current and functionally tested for initiating event.<br>Conduct heightened monitoring and evaluation.<br>Prioritize for investigations to support justification for remediation considering consequences and other factors.  |
| <b>IV</b><br><b>PRIORITY</b><br>(Marginally Safe)            | <b>INADEQUATE WITH LOW RISK</b><br>For confirmed and unconfirmed dam safety issues, the combination of life, economic, or environmental consequences with probability of failure is low and may not meet all essential USACE guidelines.  | Conduct elevated monitoring and evaluation.<br>Give normal priority to investigations to validate classification, but no plan for risk reduction measures at this time.  |
| <b>V</b><br><b>NORMAL</b><br>(Adequately Safe)               | <b>ADEQUATELY SAFE</b><br>Dam is considered adequately safe, meeting all essential USACE guidelines with no unconfirmed dam safety issues, AND RESIDUAL RISK IS CONSIDERED TOLERABLE.   | Continue routine dam safety activities, normal operation, and maintenance.   |

\* At any time for specific events a dam, from any action class, can become an emergency requiring activation of the emergency plan



# DSAC 1 PROCESS

DSMS



# HOW WE HAVE REDUCED RISK

## IMPLEMENTED IRRMS

- ▶ Installed additional piezometers
- ▶ Rehab existing relief wells & added relief wells
- ▶ Properly abandoned old relief wells
- ▶ Constructed toe drain and interior collection system
- ▶ Stockpile of materials for future events
- ▶ Interim Surveillance Plan
- ▶ Adding the 3<sup>rd</sup> pump and new emergency generator for pump station, which it was originally designed to have
- ▶ Added Alert System At Diversion Dam



# STUDY & REPORT SCHEDULE



# REVIEW & APPROVAL SCHEDULE



# STEP 2: ESTIMATE EXISTING & FUTURE W/O ACTION RISK CONDITION

- **TOTAL BASELINE CONDITION**
  - PREPARED FOR RISK MANAGEMENT MEASURES IDENTIFICATION MEETING (RMMIM)
  - **13 SEPT 2013**
  
- **ENGINEERING BASELINE STUDIES**
  - RISK ASSESSMENT
  - RISK ESTIMATE
  - DRAFT PRESENTED TO DSOG **26 JULY 2013**
  - FINALIZED TO ADDRESS DSOG COMMENTS BY **09 AUG 2013**
  
- **PLANNING BASELINE STUDIES**
  - ECONOMIC ANALYSIS
  - HABITAT BASELINE STUDY
  - HTRW BASELINE STUDY
  - HISTORIC PROPERTY BASELINE STUDY
  - COMMUNITY IMPACTS BASELINE STUDY
  - FINAL DRAFTS COMPLETED **19 JUNE 2013**
  - FINALIZED AFTER **13 SEPT 2013** AT RMMIM



# BASELINE RISK ASSESSMENT

RISK

- **PURPOSE**

- TO DEFINE RISK TO PUBLIC AND WHAT RISK IS IN A W/O PROJECT CONDITION OR IF NO ACTION WAS TAKEN
- IDENTIFY SIGNIFICANT FAILURE MODES THAT MUST BE ADDRESSED

- **PROCESS**

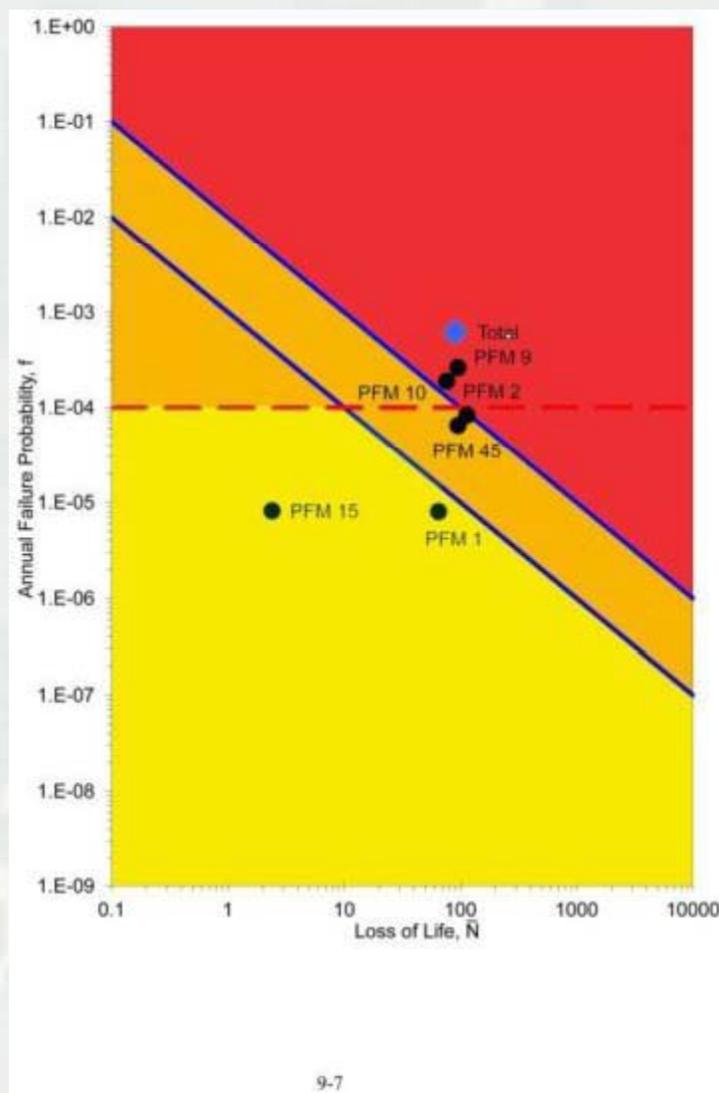
- RISK MANAGEMENT CENTER MANAGES
  - ASSIGNS SENIOR/TECHNICAL ADVISORS
  - ASSIGNS A RISK CADRE
- DISTRICT / DAM SAFETY PRODUCTION CENTER (DSPC) CHARACTERIZE SITE AND PROVIDE ALL BACKGROUND DATA
- RISK CADRE: POTENTIAL FAILURE MODES
  - NARROWS DOWN TO CREDIBLE MODES
- RISK CADRE: EXPERT OPINION ELICITATION
  - ASSIGNS PROBABILITIES TO NODES
    - FLAW; INITIATION; CONTINUATION; PROGRESSION; INTERVENTION; BREACH



# ENG: BASELINE RISK ESTIMATE

## GOALS

- HAVE BASELINE DATA TO MEASURE EFFECTIVENESS & COMPLETENESS OF ALTERNATIVES AGAINST
- ALSO QUALITATIVELY CONSIDER
  - ECONOMIC
  - SOCIETAL
  - HISTORICAL
  - COMMUNITY
  - ENVIRONMENTAL



← THIS IS AN EXAMPLE ONLY



# PLANNING BASELINE STUDIES

PD

- **PURPOSE**

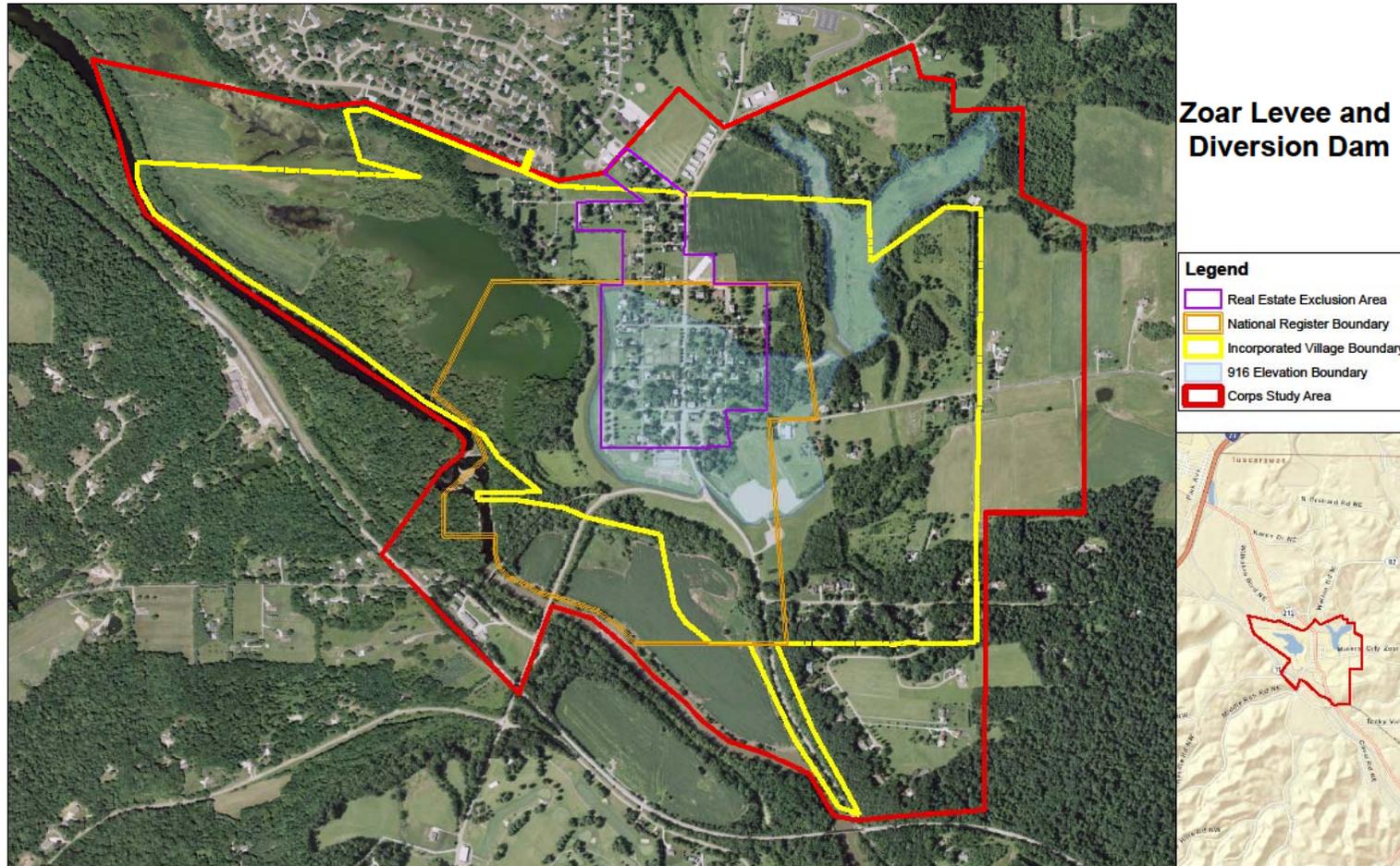
- TO HELP DEFINE W/O PROJECT CONDITION OR WHAT WOULD HAPPEN IF NO ACTION WAS TAKEN
- IDENTIFY SIGNIFICANT RESOURCE CONSTRAINTS TO CONSIDER DURING FORMULATION, EVALUATION, COMPARISON OF ALTERNATIVES
- 4 ACCOUNTS WE USE
  - NED – Contributes to National Economic Development
  - EQ – Environmental Statutes
  - OSE & RED: Community, Social and Local Economic Development

- **PROCESS**

- DEFINE A STUDY AREA
- GATHER & ANALYZE DATA
  - ECONOMIC – NED
  - HABITAT – EQ
  - HTRW - EQ
  - HISTORIC PROPERTIES - EQ
  - COMMUNITY IMPACTS – OSE & RED



# PLANNING BASELINE STUDY AREA

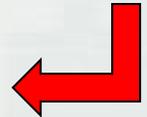


# PLANNING BASELINE STUDIES

- GOALS**

- TO HAVE BASELINE DATA TO MEASURE THE EFFICENCY & ACCEPTABILITY OF ALTERNATIVES AGAINST

**THIS IS AN EXAMPLE ONLY**



| EFFECTS               | W/O PROJECT OR BASELINE | ALT A | ALT B | ALT C | ALT D |
|-----------------------|-------------------------|-------|-------|-------|-------|
| NET ECONOMIC BENEFITS | LOW                     | 0     | -     | +     | ++    |
| COMMUNITY             | HIGH                    | --    | 0     | 0     | -     |
| REGIONAL ECONOMY      | MODERATE                | --    | +     | 0     | +     |
| HISTORIC PROPERTIES   | HIGH                    | --    | ++    | -     | 0     |
| SIGNIFICANT HABITAT   | MODERATE                | +     | 0     | 0     | -     |
| HTRW                  | MODERATE                | ++    | 0     | 0     | -     |

0 = no change / + beneficial / ++ = very beneficial / - adverse / -- very adverse



# BASELINE ECONOMIC ANALYSIS

## NED (NATIONAL ECONOMIC DEVELOPMENT) ANALYSIS

### GOALS:

- To assess economic benefits and costs
- To find the alternative with the highest net benefits not the least costly

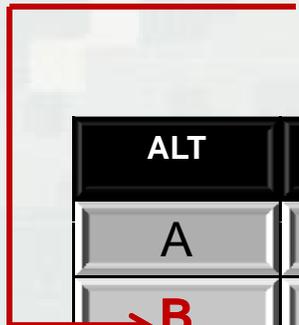
### PROCESS:

- NED analysis
  - Net benefits (reduction in damages)
  - Net costs (associated with construction, operations and maintenance)
  - Benefit to cost ratio (considered for funding prioritization)
- Strict rules for what can and can't be considered damages

THIS IS AN  
EXAMPLE  
ONLY



**NED PLAN**



| ALT      | Cost           | Benefits        | Net Difference  |
|----------|----------------|-----------------|-----------------|
| A        | \$100          | \$110           | \$10            |
| <b>B</b> | <b>\$5,000</b> | <b>\$25,000</b> | <b>\$20,000</b> |
| C        | \$30,000       | \$32,000        | \$2,000         |
| D        | \$80,000       | \$70,000        | \$10,000        |

Cost to build project

Flood Damages Prevented



**HELP US IMPROVE OUR DATA**

# BASELINE HABITAT STUDY

**GOAL:** To identify significant habitat

**PROCESS:** Using existing resource laws to measure significance

- National Environmental Policy Act

- ▶ USACE

- ▶ EPA



- Clean Water Act

- ▶ USACE

- ▶ Ohio Environmental Protection Agency



- Endangered Species Act

- ▶ US Fish and Wildlife Service



EQ Habitat

# Zoar Habitat Study

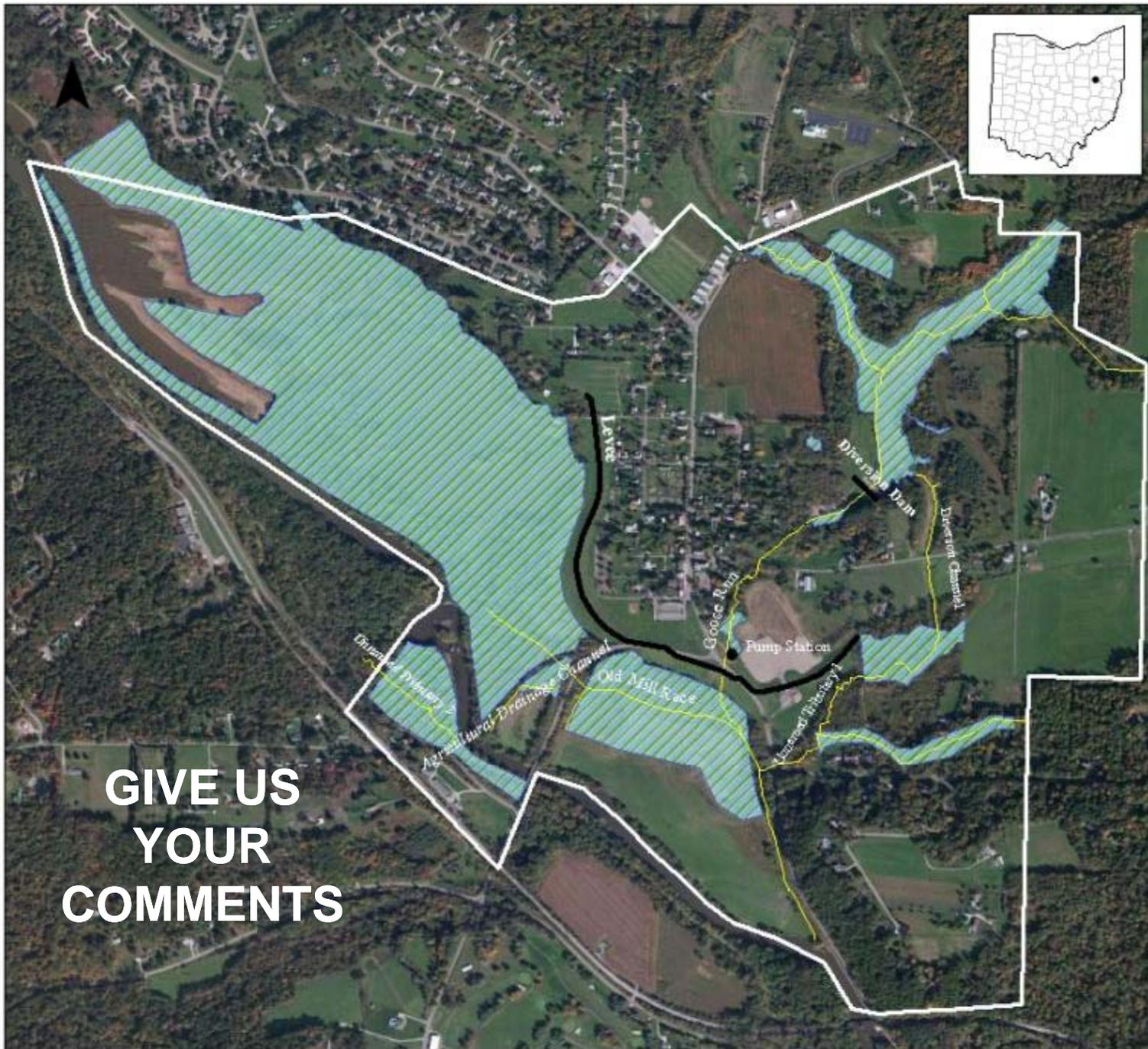
## Zoar Habitat Study

- Pump Station
- Drainage Features
- Levee & Diversion Dam
- Wetland
- Corps Study Boundary

0 0.1 0.2 miles



US Army Corps of Engineers



**GIVE US  
YOUR  
COMMENTS**

# BASELINE HTRW ANALYSIS

## DEFINITIONS

### Hazardous Toxic & Radioactive Waste

Describe a material that is detrimental to the environment and human health.

### Environmental Site Assessment (ESA)

An ESA is a report that summarizes a site visit and records review of a property and its surrounding area to determine if any additional environmental investigation is warranted to understand the liability risks associated with the identified property.



# DRAFT HTRW RESULTS

## METHODS:

- Phase I ESA on Baseline Study area
- Records Review
- Site Reconnaissance
- Interviews
  - Seeking more input today.

**LET US KNOW  
WHAT YOU KNOW**

## RESULTS:

- There are several potential HTRW concerns within the Study Area:
  - It is possible that many structures in the study area contain material such as, asbestos, heating oil tanks, transformers.
  - There may also be potential impact of past industries in the Village: for example:
    - Blacksmithing (coal/metals);
    - Tinsmithing (metals);
    - Tannery (acids, metals);
    - Agriculture (pesticides, herbicides).



# BASELINE HISTORIC PROPERTY STUDY

## OBJECTIVES

### HELP US IMPROVE OUR STUDY

- Record pertinent data about existing and potential historic properties in Study Area through background research, survey of above-ground resources, and development of archeological probability models
- Help identify potential impacts to historic properties during evaluation and comparison of risk management alternatives
- Assist in consultation with consulting parties under Section 106 of the National Historic Preservation Act of 1966 33 USC 470(f) and 36 CFR 800
  - a) Define Area of Potential Effects
  - b) Identify Historic Properties
  - c) Consider Effects to Historic Properties
  - d) Resolve Effects to Historic Properties



# COMMUNITY IMPACTS BASELINE STUDY

**REVIEW THIS DATA FOR ACCURACY**

## DATA NEEDS & USES:

- As part of the OSE accounting process, USACE needs to collect data that:
  - ▶ Describes the complete social profile of Zoar Village
  - ▶ Identifies other social effects and regional economic development information
  - ▶ Documents the existing condition also known as the “without project” condition
  - ▶ Will also use to capture regional economic development



**This data will be used to avoid, minimize and design mitigation for impacts to social or community life, and regional economic development.**



# WORKSHOP

## VISIT BOOTHS:

- LEARN MORE ABOUT DSMS STUDY
  
- LEARN MORE ABOUT EACH BASELINE STUDY:
  - ▶ RISK ASSESSMENT / ESTIMATE
  - ▶ ECONOMICS
  - ▶ HABITAT
  - ▶ HTRW
  - ▶ HISTORIC PROPERTIES
  - ▶ COMMUNITY IMPACTS

**PROVIDE YOUR COMMENTS BY  
29 MARCH 2013**



**THANK YOU**

