



Environmental
Protection Agency

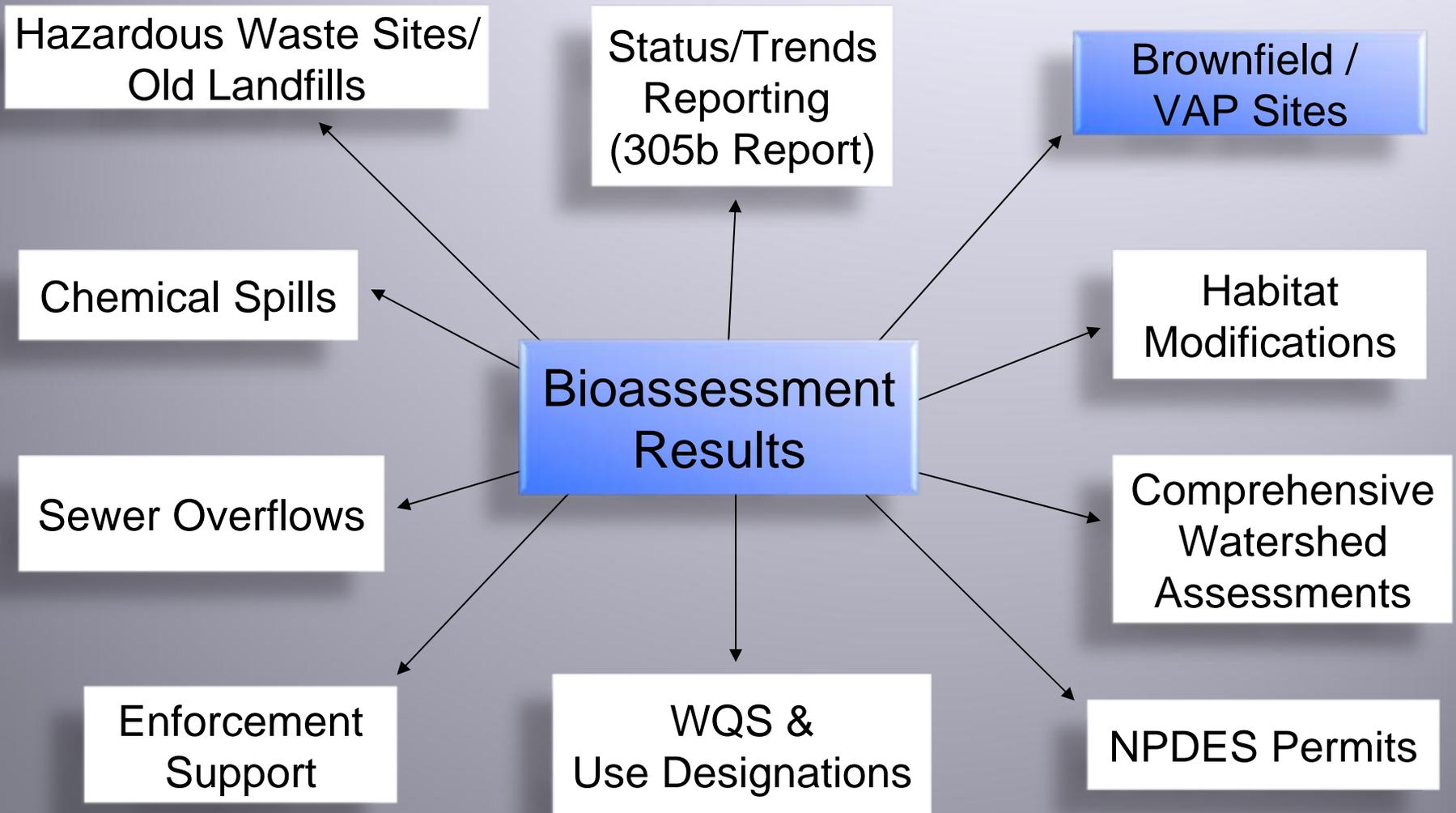
Brownfields and Rivers



Property Specific Risk Assessment Aquatic

- Must be conducted if important aquatic ecological resources or sediments are impacted (or chemical of concern has no sediment benchmark value in the benchmark hierarchy)
- Must demonstrate compliance with water resource risk goals
- Risk goals include Ohio Water Quality Standards (chemical and biological criteria)

Ohio Bioassessments - Applications



Ohio Water Quality Standards

- Uses: aquatic life habitat, recreational, agricultural, drinking water, industrial
- Criteria: chemical and biological
- Six free-from criteria: sludge deposits, floating debris or scum, nuisance conditions, etc.
- Anti-degradation clause



Ohio Aquatic Life Uses

- Exceptional Warmwater Habitat
- Warmwater Habitat
- Modified Warmwater Habitat
- Coldwater Habitat
- Limited Resource Water



Ohio Biological Criteria

- Fish (IBI, MIwb) and macroinvertebrates (ICI)
- Criteria vary by use designation and ecoregion
- 400+ Reference sites
- Adopted into Ohio Standards in 1990





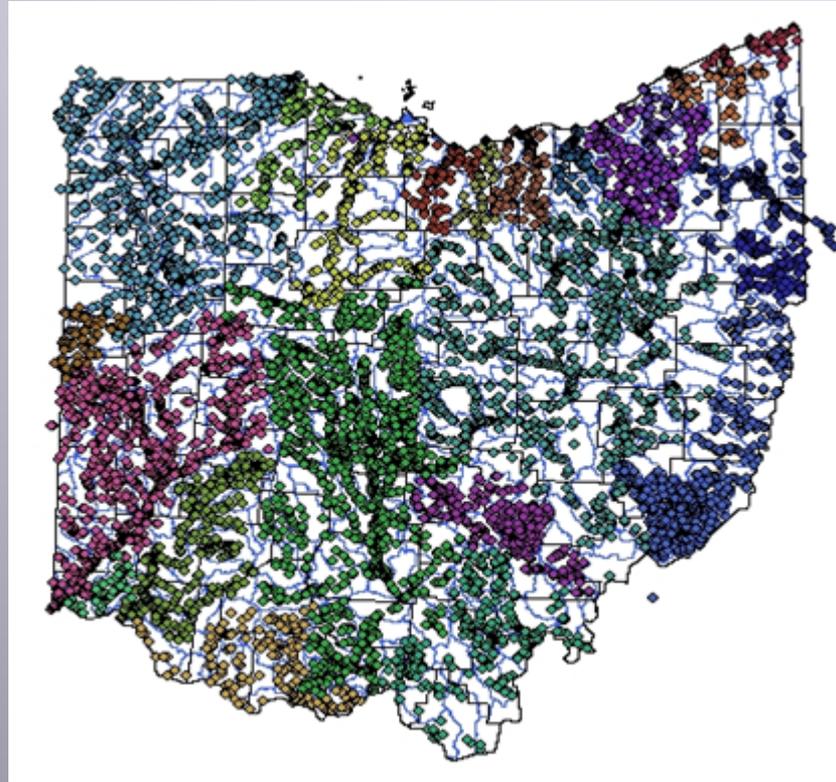
Biosurvey Components Rivers and Streams

- Fish - numbers and variety
- Macroinvertebrates – numbers and variety
- Fish anomalies – deformed, fin erosion, lesions, tumors
- Physical habitat of the stream channel
- Water chemistry
- Sediment chemistry

Ohio EPA's Biological Sampling 1978 – 2009 (32 years)

BUGS

30 million
11,320 samples
8,436 sites
2,326 rivers
1,258 taxa



FISH

9.9 million
22,592 samples
10,732 sites
2,592 rivers
151 species

**Data within 10 years old can be
used in the ecological assessment**

Fish Methods



- Pulsed DC electrofishing
- Sampling based on distance
- Summer/fall collection period
- Weight (> 20 square miles)
- External Condition (DELTs)
- Identify to species level
- Abundance

Electrofishing

Boat



Wading



Headwaters



Fish Anomalies – DELTs

(Deformities, Eroded fins, Lesions, Tumors)



Macroinvertebrate Methods



- Artificial substrates (HDs) & qualitative dip-net/ handpick
- HDs set for six week period
- Taxonomy to genus or species



Macroinvertebrate HD (quantitative) collection





Macroinvertebrate qualitative collection



Macroinvertebrate lab work



Quantitative Habitat Evaluation Index (QHEI)



Channel
Quality



Instream
Cover



Substrate
Quality

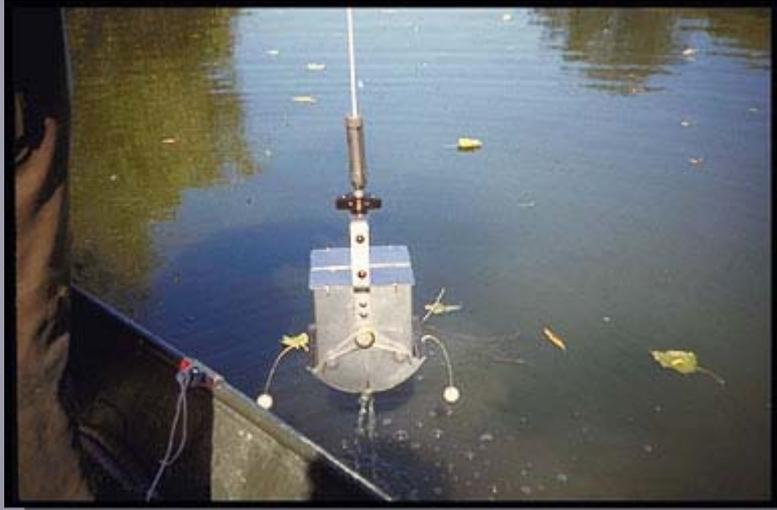
Pool/ Riffle/ Run

Surface Water

- Grab samples
- Use Ohio EPA QA manual
- Results compared to criteria or background



Sediment



- Multi-incremental samples
- Ohio EPA Sediment Manual
- Use benchmarks – Ohio EPA Sediment Reference Values, MacDonald, or USEPA numbers - sediment criteria do not exist

Biosurvey Requirements / Time Estimates

VAP/ Brownfield Protocol

Minimum of three sample locations: upstream,
adjacent, downstream

Field Work

Fish: 4-6 hours per location (2 sampling passes)

Macroinvertebrate: 1-2 hours per location

Physical Habitat: 30 minutes per location

Lab Work

Fish: less than 30 minutes per sample

Macroinvertebrates: 12 hours per location

Water Resource Evaluation

- Verify or establish aquatic life use designation
- Determine attainment status of water quality standards
- Compare water chemistry results to water quality criteria
- Use benchmarks for initial sediment assessment
- Biocriteria are used in a pass/fail evaluation
- Habitat assessments are critical in streams
- Weight of evidence approach is acceptable when evaluating results - failure of biocriteria does not spell remediation

Basic River/Stream Assessment Report



State of Ohio
Environmental Protection Agency

Division of Surface Water

Biological Assessment of the Great Miami River

Piqua Power Plant

Miami County, Ohio



November 20, 2009

Ted Strickland, Governor
Chris Korfleski, Director

Ashtabula River Habitat Restoration



5 1/2 Slip Site Location within the Ashtabula River AOC



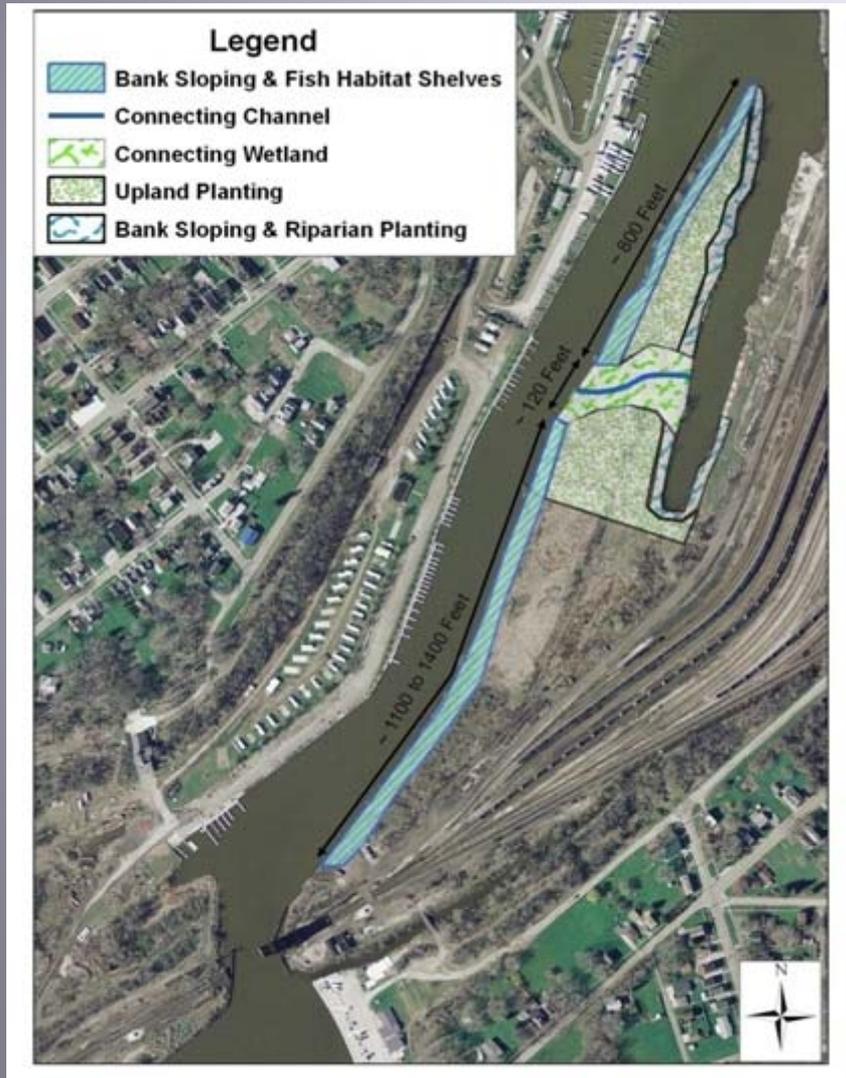
Figure 2.
Historical Photograph of the 5 1/2 Slip Peninsula area showing past industrial use

River Background

- Most of lower Ashtabula River has armored banks
- Lower river was deep draft commercial harbor
- Recreational marinas are now common
- Lower 2 miles are a Great Lakes Area of Concern



Project Background



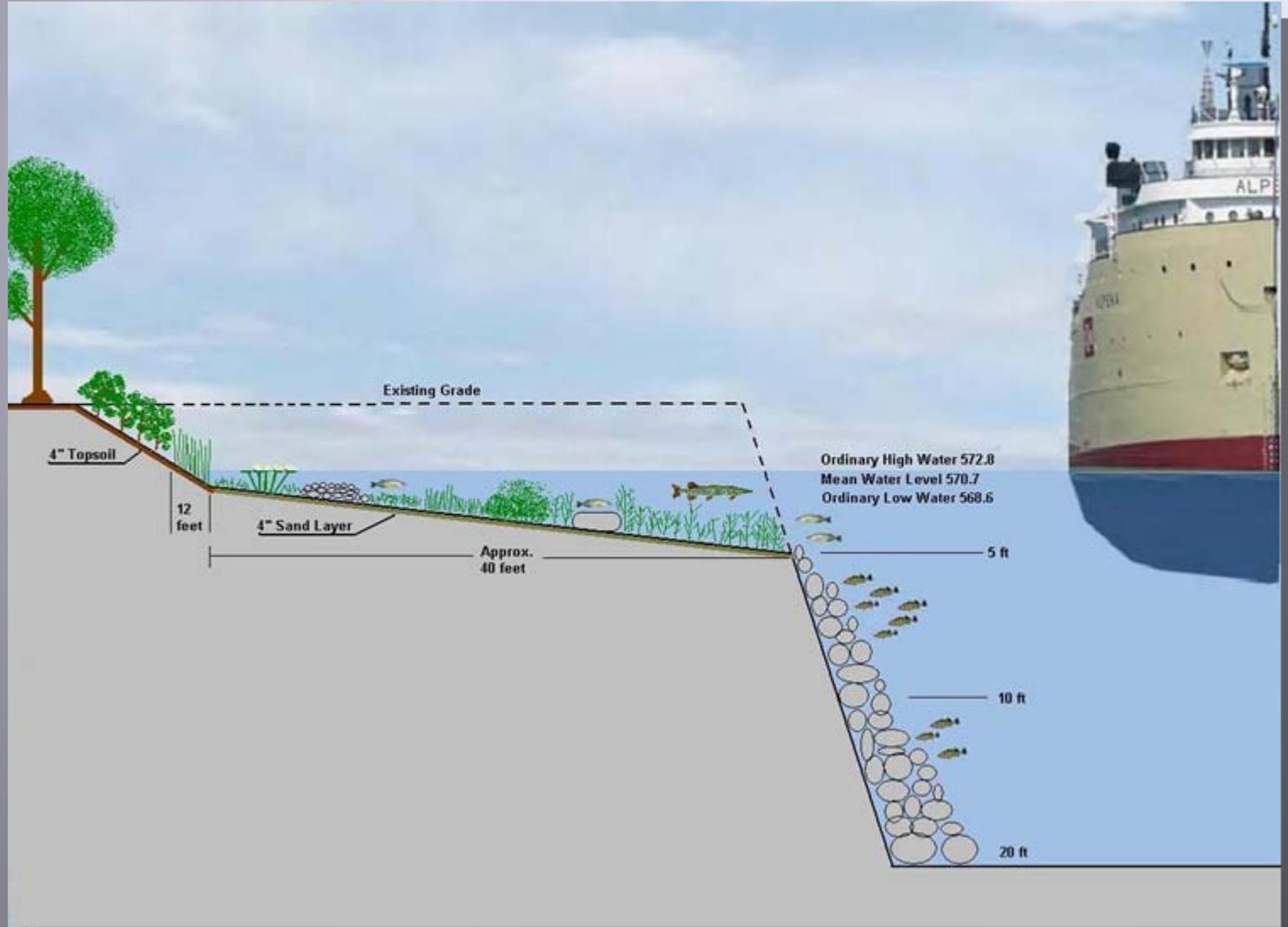
- Contaminated sediment remediated
- Three beneficial use impairments – degrade fish, benthos, and habitat
- Habitat restoration – delist Area of Concern
- Over 2200 linear feet of shoreline will be restored
- Fish shelf with vegetation and substrate diversity

Project Description

- Habitat shelf excavated next to navigation channel
- <math><1:1</math> steep slopes changed to 6:1
- Shelf depth 0-5 feet
- Hard clay surface covered with sand layer
- Native aquatic vegetation planted
- Variety of hard substrates added to shelf



Habitat construction in Ashtabula River estuary



Ashtabula River post construction



Reconstruction
should look natural



Not artificial



If you can, keep the riparian trees!

