SOFT SHORELINE ENGINEERING: WE BUILT IT, HAVE THEY COME?

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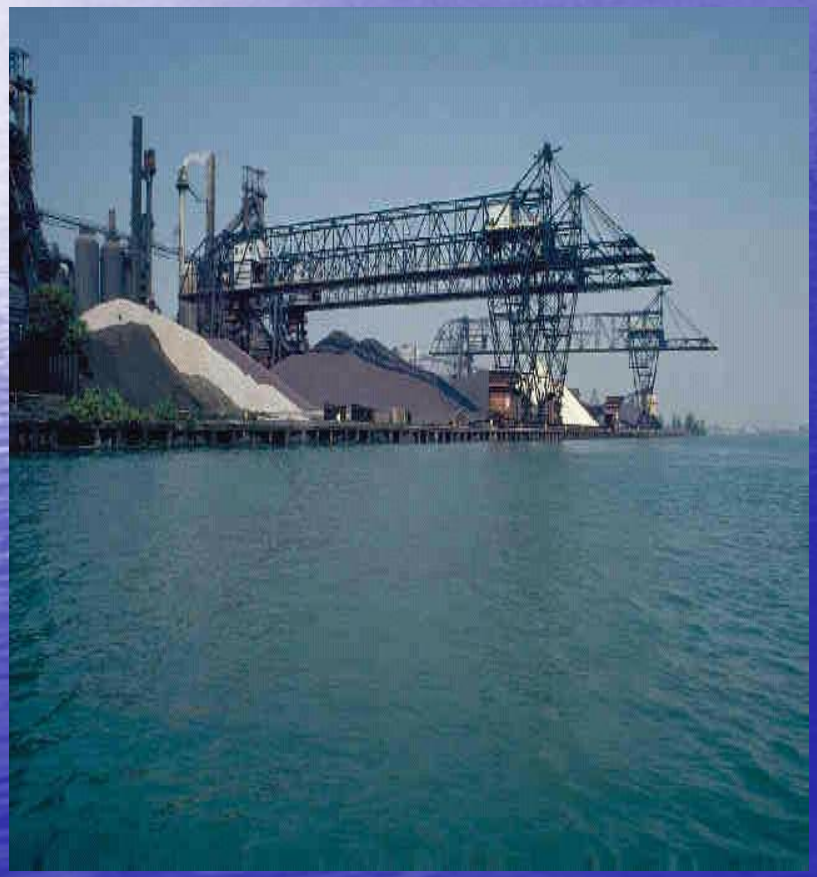
SINGLE PURPOSE SHORELINE DEVELOPMENT



Historically, many river shorelines were stabilized and hardened with concrete and steel to protect developments from flooding and erosion, or to accommodate navigation and industry

HARD ENGINEERING OF SHORELINES

- Concrete breakwalls or steel sheet piling are used to reduce erosion, stabilize shorelines for commercial, industrial and other uses, and achieve safety
- There are many places where hard engineering is required for navigational purposes

HARD ENGINEERING OF SHORELINES

- Achieves stability and safety, but has no habitat value
- It can cost as much as $2,400 per linear foot

SOFT ENGINEERING OF SHORELINES

- Use of ecological principles and practices to reduce erosion and achieve stability of shorelines and safety, while enhancing habitat, improving aesthetics, and even saving money
- Using rocks, vegetation, and other materials to soften the land-water interface, thereby improving the ecological value without compromising engineering integrity of the shoreline

SOFT ENGINEERING OF SHORELINES *(continued)*

- There is growing interest in using soft engineering of shorelines in appropriate locations
- Clearly, many waterfronts and shorelines can to be designed and managed for multiple uses so that additional benefits can be accrued

Best Management Practices for *soft engineering* of Shorelines

Based on a Binational Conference Sponsored by the Greater Detroit American Heritage River Initiative and Partners

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36 SOFT ENGINEERING PROJECTS IN 10 YEARS

- 28 along Detroit River
- 5 along Rouge River
- One along Little River
- One along Frank & Poet Drain
- One along River Raisin

$16.5 MILLION IN 36 PROJECTS

- $0-50 K – 10 projects
- $50-100 K – 9 projects
- $100-500 K – 7 projects
- $500 K-1 Million – 7 projects
- ≥ $2 Million –3projects

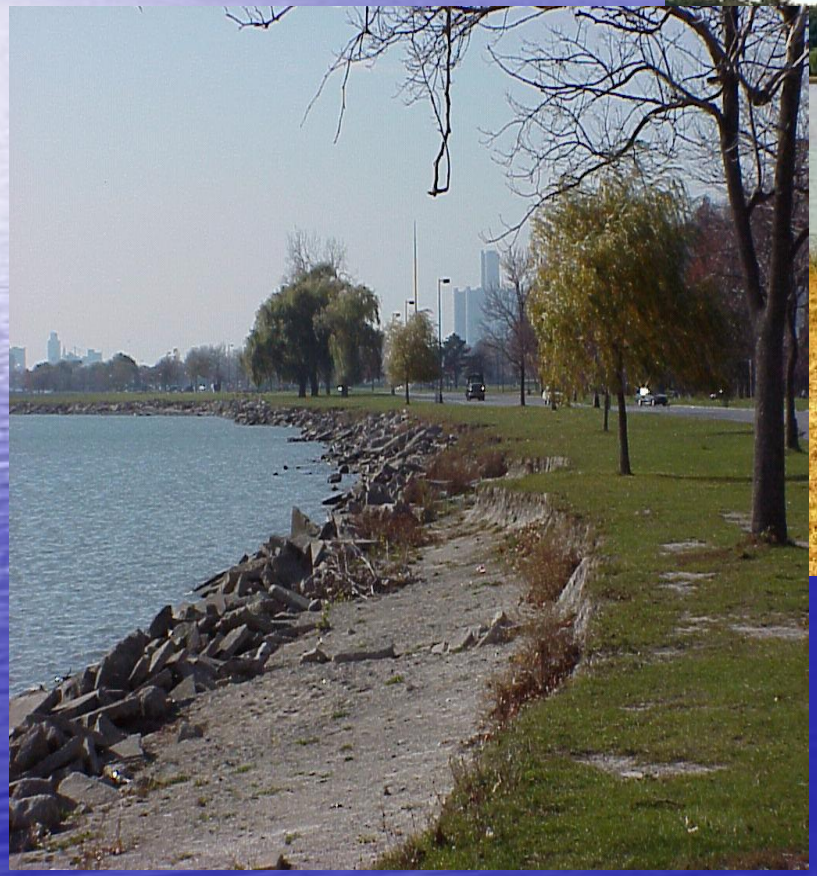
PRIMARY OBJECTIVES

- Stabilize shoreline and enhance habitat – 25 projects
- Restore natural shoreline – 3 projects
- Remediate contaminated sediment and enhance habitat – 2 projects
- Storm water treatment and habitat enhancement – 2 projects
- Restore oxbow – 2 projects
- SEPs – 2 projects
- Build stream crossing and enhance habitat – 1 project

POST-PROJECT ASSESSMENT

- Only 6 of 36 projects (17%) had quantitative assessment of ecological effectiveness
- The remaining 30 projects either had no post-project monitoring of effectiveness or only qualitative assessment through visual site inspections or photographic documentation of results

Lake Muskoday Shoreline Belle Isle



Windsor's Goose Bay

Before

After

Maheras-Gentry Park (Detroit)

Milliken State Park - Detroit

DTE's Rouge Power Plant

BLACK LAGOON TO ELLIAS COVE

Wayne County's Elizabeth Park

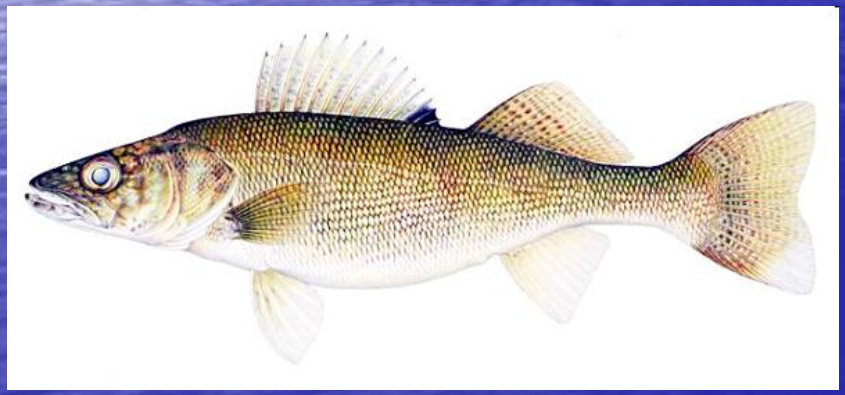
Before

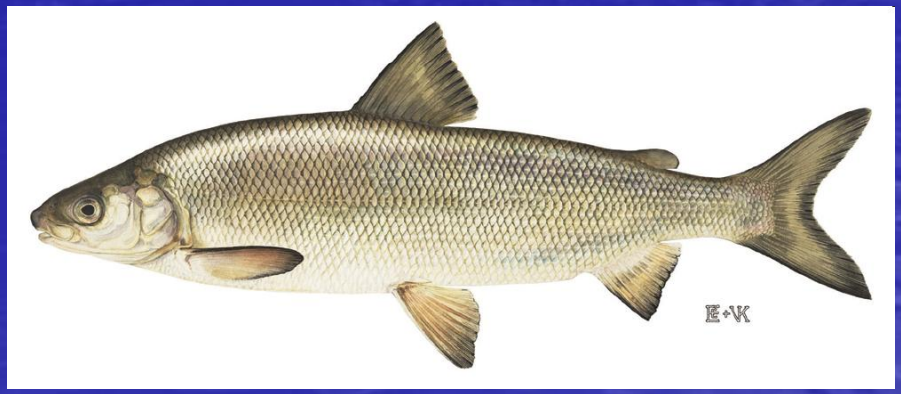
After

FORT MALDEN, AMHERSTBURG, ONTARIO

FORT MALDEN, AMHERSTBURG

- Natural reproduction documented for at least four species





SOFT ENGINEERING

- 36 soft engineering projects in 10 years
- All have been very well received by stakeholders
- All provide teachable moments

KEY LESSONS

- Involve habitat experts up-front in the design phase of waterfront planning
- Establish multiple objectives for shoreline engineering
- Ensure sound multidisciplinary technical support throughout the project
- Treat habitat projects as experiments
- Start with demonstration projects and attract many partners to leverage resources

KEY LESSONS *(continued)*

- Only 6 of 36 projects (17%) have quantitative assessment of ecological effectiveness
- Involve volunteers and researchers in monitoring, and obtain commitments for post-project monitoring of effectiveness up-front in project planning
- Measure benefits and communicate successes
- Promote education and outreach, including public events that showcase results and communicate benefits

THANKS TO ALL THE PARTNERS!