



# **PROMOTING ENVIRONMENTAL SUSTAINABILITY VIA AN EXPERT ELICITATION PROCESS**

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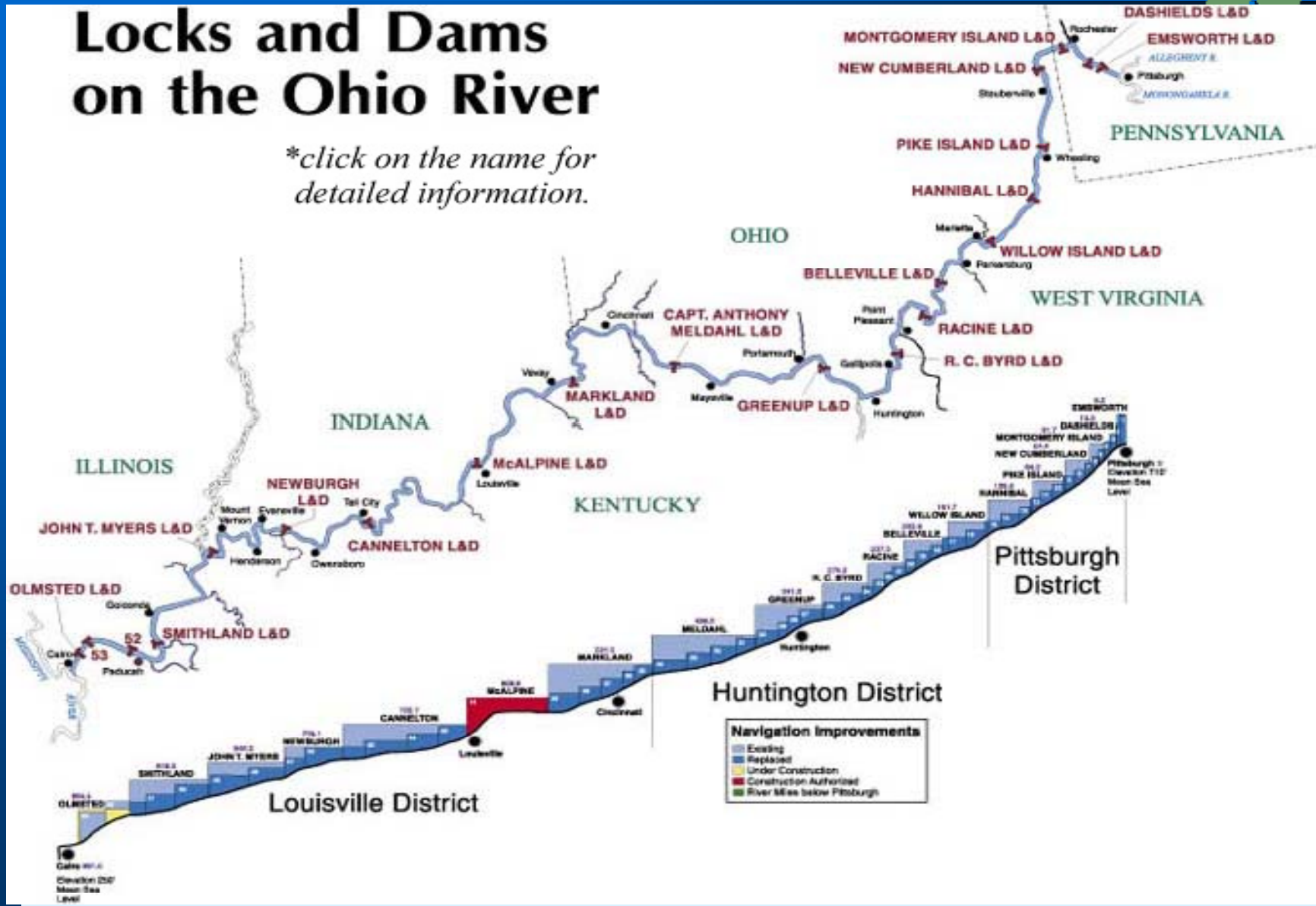
# Case Study - ORMSS



- **Navigation infrastructure study related to 20 locks and dams on the 981-mile Ohio River**
- **CEA was the integrator of the effects of lock changes, maintenance, and rehabilitation, and other P, Pr, and RFF actions**
- **Integrated Main Report (includes PEIS) – PEIS was “high altitude study”**
- **PMP in 2001 – three post-2001 events influenced PEIS**

# Locks and Dams on the Ohio River

*\*click on the name for detailed information.*



# Main Chamber Closures



# Three Events



- **2001 – NRC study on Upper Mississippi River navigation – recommended that ES be considered; it is important in CEA**
- **2002 – 2003 – HQUSACE guidance on ES**
- **2002 – Corps’ environmental operating principles**

# HQUSACE Guidance



- **Environmental and economic considerations**
  1. **Alternatives that would modify the navigation system to restore or improve the environment will be evaluated**
  2. **All recommended plans, regardless of outputs, will seek to achieve environmental sustainability**



- **“Sustainability is a synergistic process whereby environmental and economic considerations are effectively balanced throughout the life cycle of project planning, design, construction, operation and maintenance to improve the quality of life for present and future generations.”**

# Environmental Operating Principles



- **Principle 1 - Strive to achieve environmental sustainability. An environment maintained in a healthy, diverse and sustainable condition is necessary to support life.**

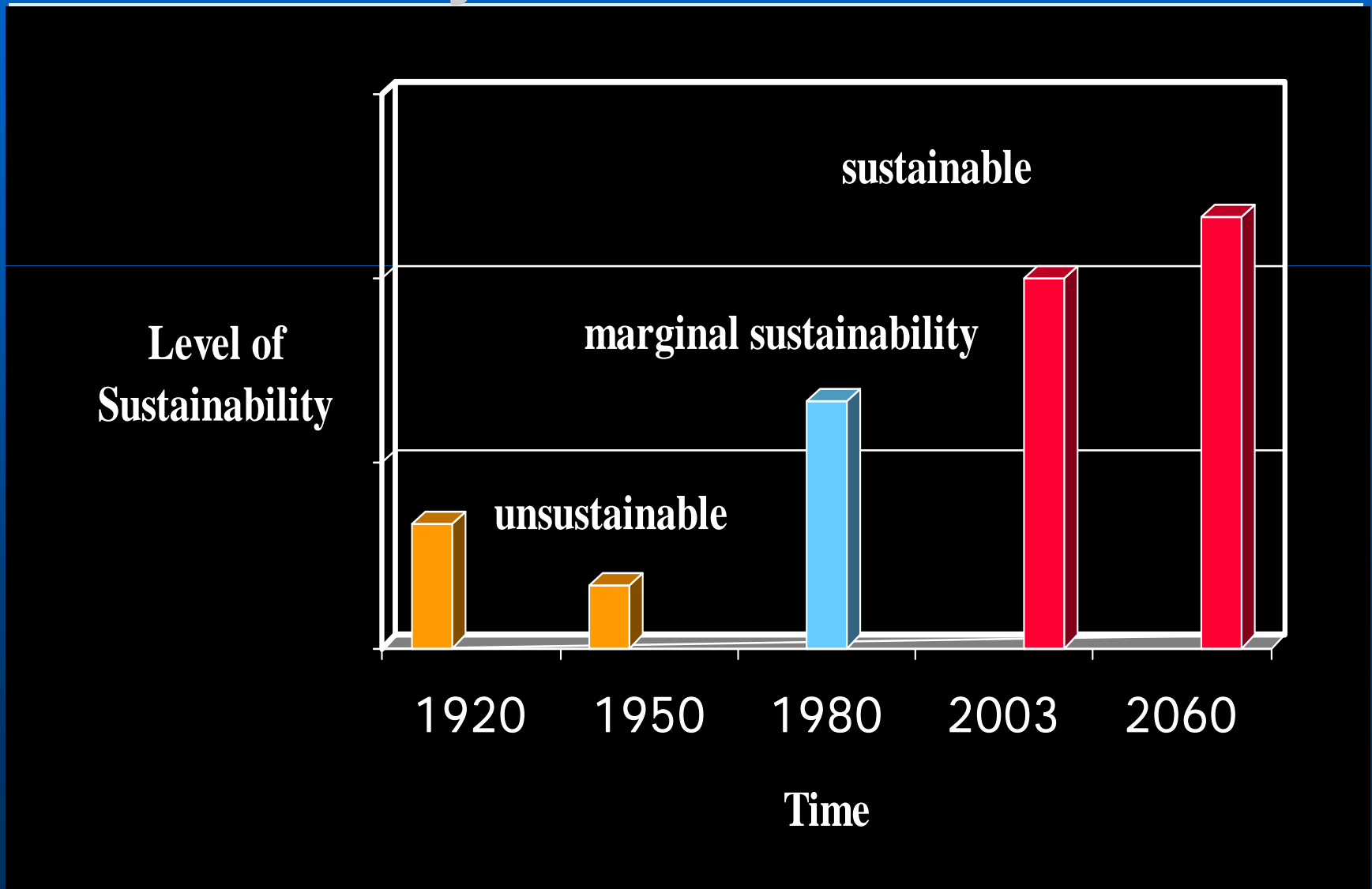


# CEA Study



- **ES introduced into study after CEA had been conducted on selected VECs**
- **Two key VECs were aquatic resources and riparian resources; had conducted a sustainability assessment for each**
- **Used Expert Elicitation Process – group of experts for each of the key VECs (23 aquatic and 15 riparian)**
- **Enhancing ES was a study objective<sub>9</sub>**

# Classifications of Environmental Sustainability



# ES Actions



Unsustainable

Fully Sustainable

Actions with positive effects

Resource Condition

Actions with negative effects

What are the major factors that affect sustainability of this resource?  
Adversely/Beneficially

What are the indicators that tell the status and trend of the sustainability of this resource?

# EE Group Process



- **Described constraints**
- **Posed questions regarding sustainability to the group**
- **Analyzed responses and condensed into succinct, actionable objectives**
- **Prioritized**
- **Reviewed and refined**

# Constraints



- 1. System is highly modified and will remain so**
- 2. Focus on ecological processes**
- 3. Don't be concerned with:**
  - Who is responsible**
  - Who will implement improvements**
  - Who will pay for improvements**
  - When it will occur**

# Questions



- 1. What do we want the resources to look like?**
- 2. What needs to happen to attain this vision?**
- 3. What are the possible indicators of sustainability?**

# Aquatic Group Results



- **What do we want the resources to look like?**
  1. **A complex and interconnected system of physical habitat features accompanied by balanced nutrient and energy cycling and minimal amounts of chemical and bacteriological contamination.**
  2. **These habitats would support a diverse, self sustaining and resilient biological community dominated by native species.**



- **What needs to happen to attain this vision of the Ohio River?**

- **Habitat**

- **Connectivity Actions**
- **Complexity Actions**
- **Nutrient Balance Actions**
- **Contaminant Actions**





- **What needs to happen to attain this vision of the Ohio River? (continued)**

- **Biological**

- **Composition Actions**

- **Function Actions**

- **Policy/Procedural Actions**

- **Regulatory Actions**

- **Policy Actions**



- **What are possible indicators of environmental sustainability?**
  1. **Scientific Measures**
  2. **Composite Indicators of Sustainability**
  3. **Specific Monitoring Needs**

# ES Actions



- **Based on the results of the EE Process, the CPT identified 26 ES actions and divided them into four groups**
- **Group A: Measures for which authority already exists and which involve minimal costs. These measures would also increase awareness of key VECs, focus on impact prevention, and could be implemented relatively quickly. (Four measures; e.g., mark critical locations to prevent mooring near mussel beds or special shoreline areas)**



- **Group B: Measures for which authority already exists, but which would require some costs for planning and/or construction. These measures focus on key VECs and incorporate restoration and enhancement. (Ten measures; e.g., create spawning shoals and other in-stream features to enhance habitat diversity in navigation pools)**



- **Group C: Measures for which some authority already exists, but new authority may be needed for some opportunities. Planning and construction costs may be relatively high. These measures generally encompass broad descriptions of opportunity that may need refinement and the focus tends toward broader-level environmental needs. (Five measures; e.g., restore wetlands in upper ends of embayments to reduce siltation and create fish and wildlife habitat)**



- **Group D: Measures which require new authorities or are primarily addressed through authorities of other agencies (e.g., USEPA). Planning and construction costs may be relatively high. These measures generally encompass broad descriptions of opportunity that may need refinement, and the focus tends toward broader-level environmental needs. (Seven measures; e.g., enhance fish passage around or through dams.)**



- **Three ES alternative plans were evaluated along with four navigation infrastructure improvement plans. The three ES plans were referred to as:**
  - **Minimal ES plan (Groups A, B)**
  - **Moderate ES plan (Groups A, B, C)**
  - **Maximum ES plan (Groups A, B, C, D)**

# Lessons Learned



- **The EE process involves collaboration; and this can be useful in addressing CEs management**
- **The EE process needs to be carefully planned, implemented, and documented.**
- **Outputs from the EE process can be used in several ways in a CEA at the strategic-level.**