

EVALUATING THE USE OF FAIRMOUNT DAM FISH PASSAGE FACILITY WITH APPLICATION TO ANADROMOUS FISH RESTORATION IN THE SCHUYLKILL RIVER, PENNSYLVANIA



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Schuylkill Watershed: A Geographic Perspective

Schuylkill County

- Drains approximately 2000 square miles and travels about 130 miles
- Encompasses 11 counties

Philadelphia County



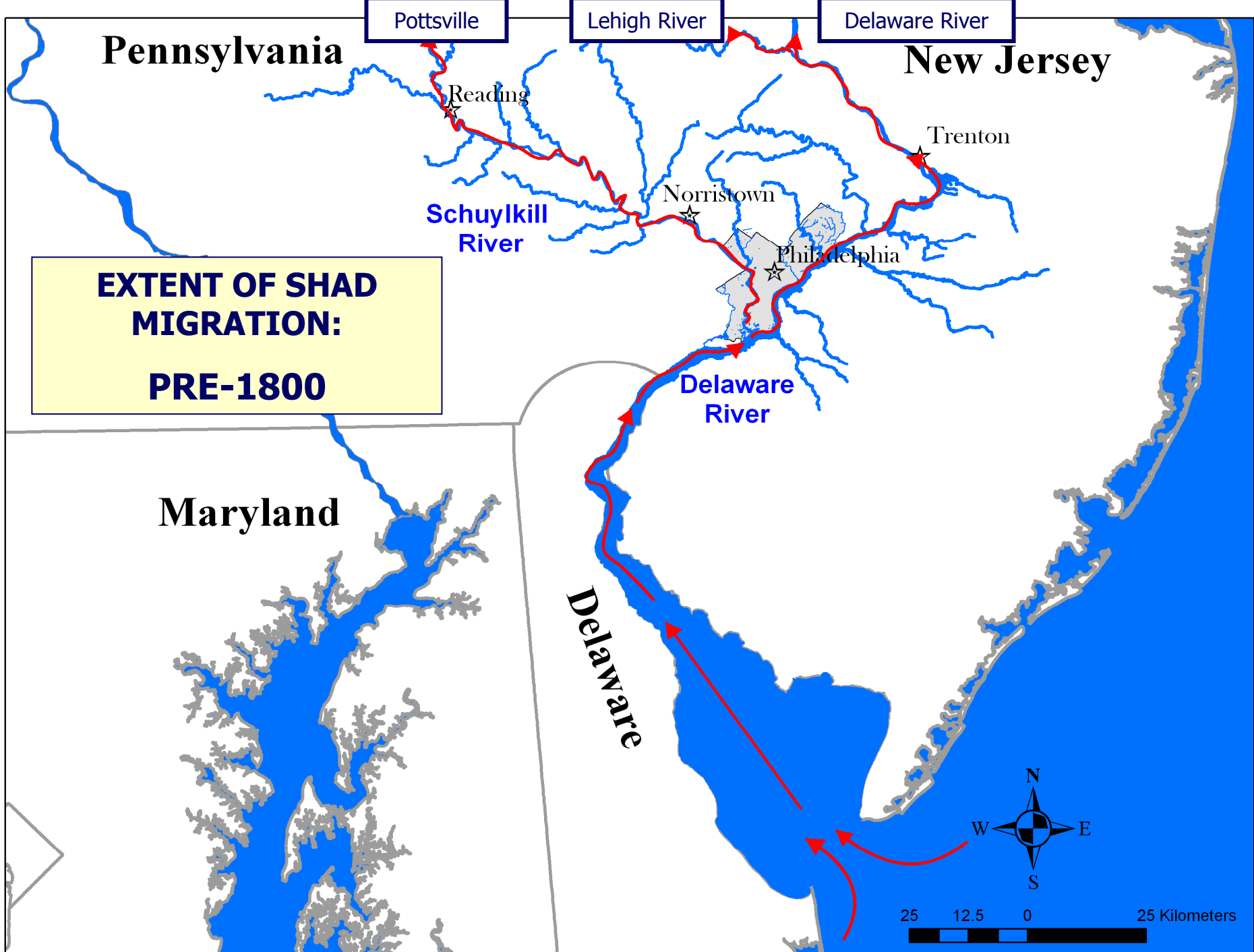
Schuylkill Watershed: *A Historical Perspective*

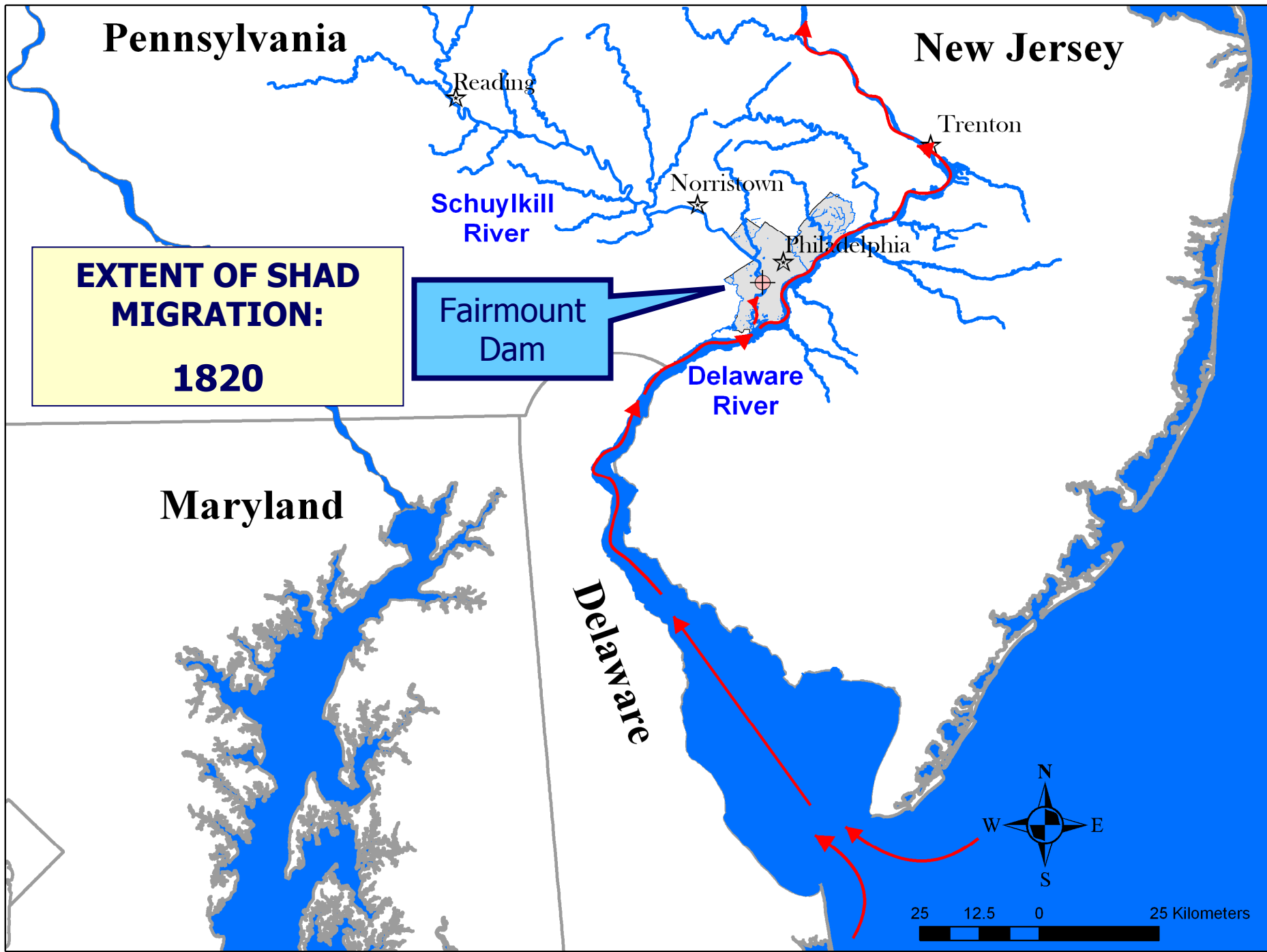
- Known as “Hidden Creek”
- Provided much of our country’s colonial and revolutionary history
- Supported a large commerce
 - Farming
 - Timber
 - Coal
 - **Fisheries**



Seining For American Shad Near Philadelphia,
Delaware River (Circa 1905)

Source: *Library Of Congress*





Historical Perspective

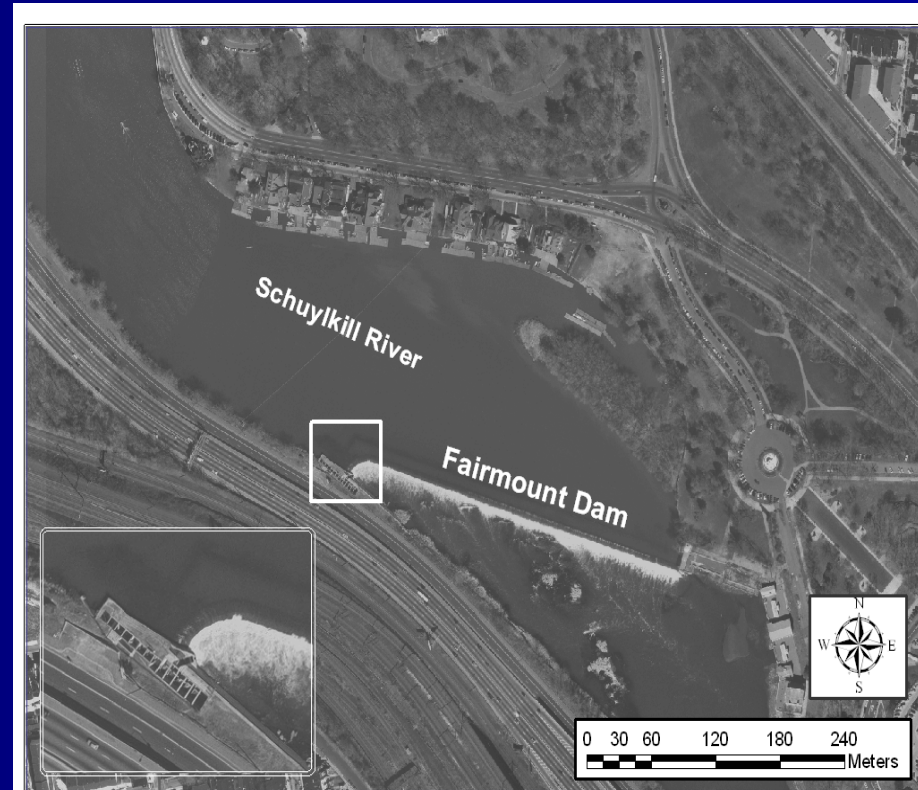
■ Fairmount Dam

- Created in 1820 as a source for drinking water
- Diverted water to power pumping station for distribution
- Eliminated runs of anadromous fish species and other semi-migratory species in the Schuylkill Drainage
- Prevented upstream dispersal (i.e., genetic transference) of resident fish species



Fairmount Fish Ladder

- Completed In 1979
- Vertical slot fish passage facility
- Heavily used by resident fish species
- By 1984, restoration and monitoring activities of migratory species were diverted to other drainages.



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Construction Of Fairmount Fish Ladder, 1978

Philadelphia Water Department's Involvement:

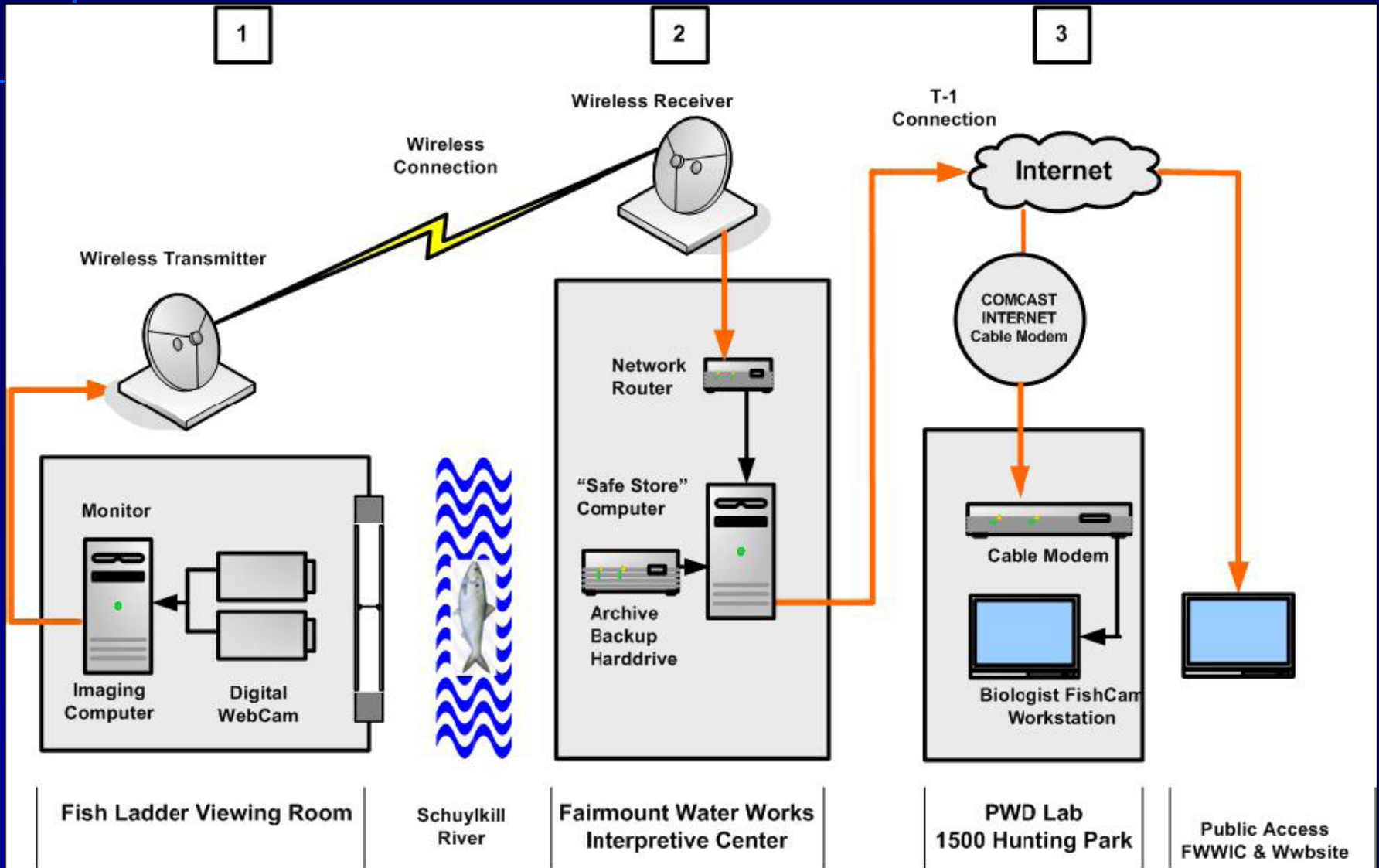
- In 2002, PWD took over the responsibility for O&M of the Fairmount Fish Ladder

- Developed a sophisticated video monitoring system
- Implemented a standard fish monitoring program
- Created a public outreach and education website
- Entered an agreement with USACE to restore and optimize fish passage facility

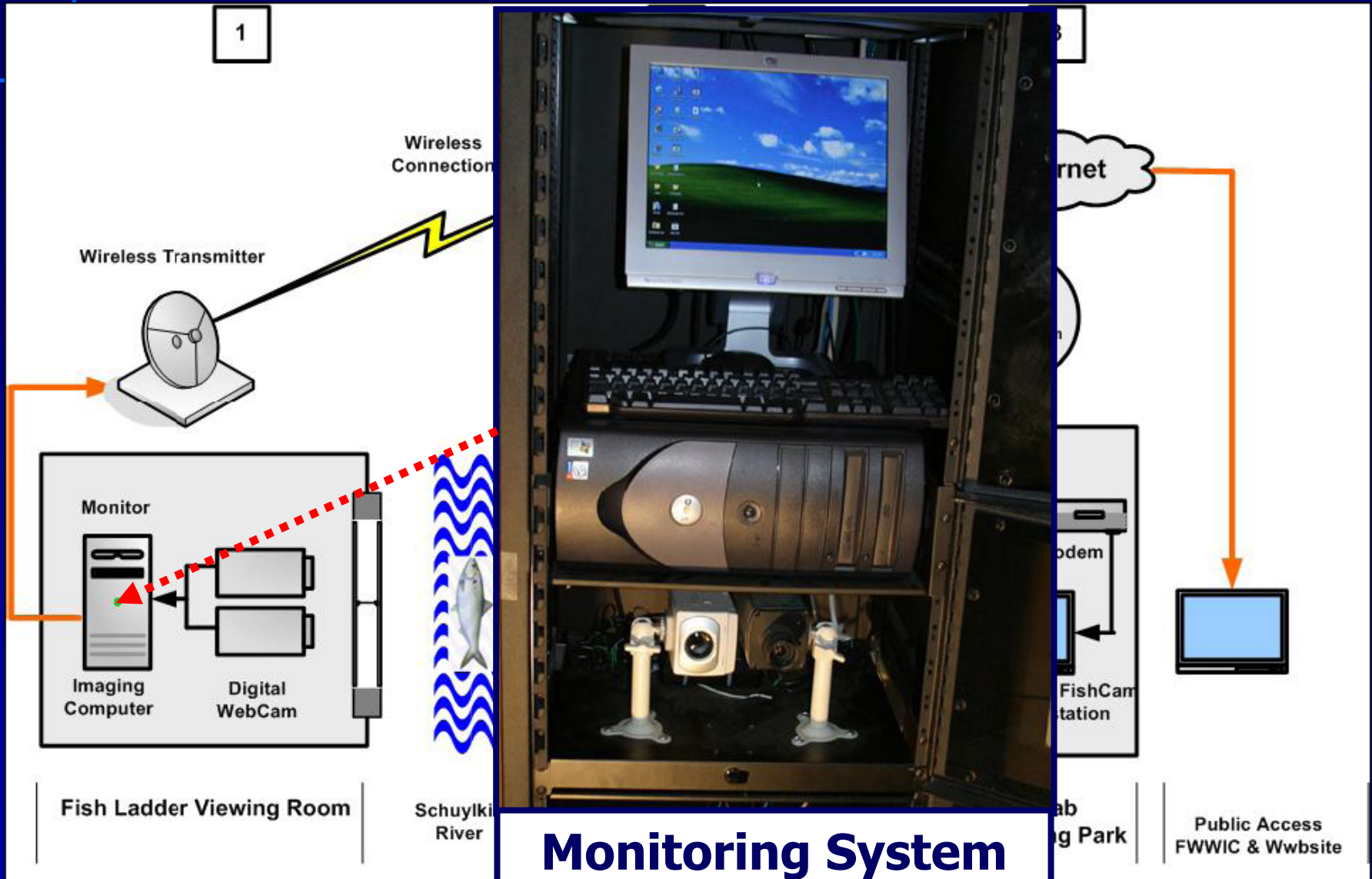


9:1 scale of the Fairmount Fish Ladder (Alden Laboratories, Worcester, MA)

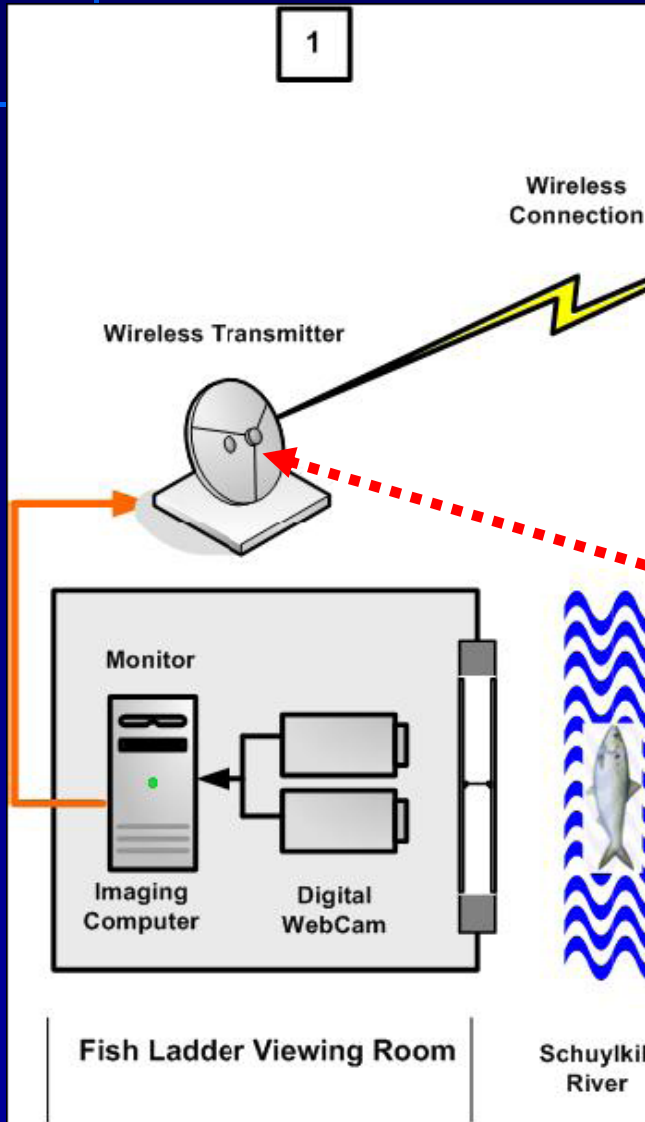
Video Monitoring System:



Video Monitoring System:



Video Monitoring System:

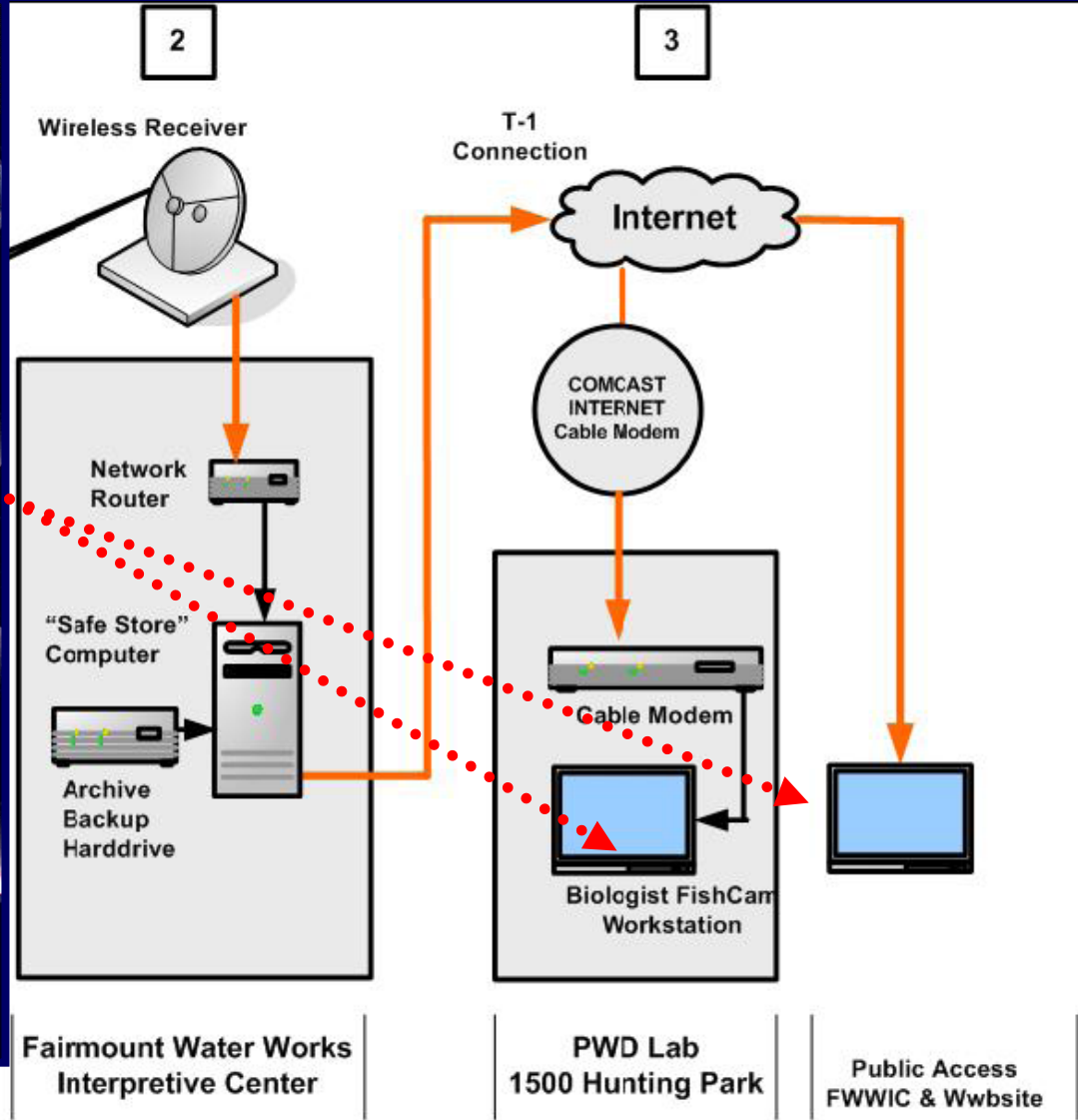


Wireless Transmitter

Video Monitoring System:

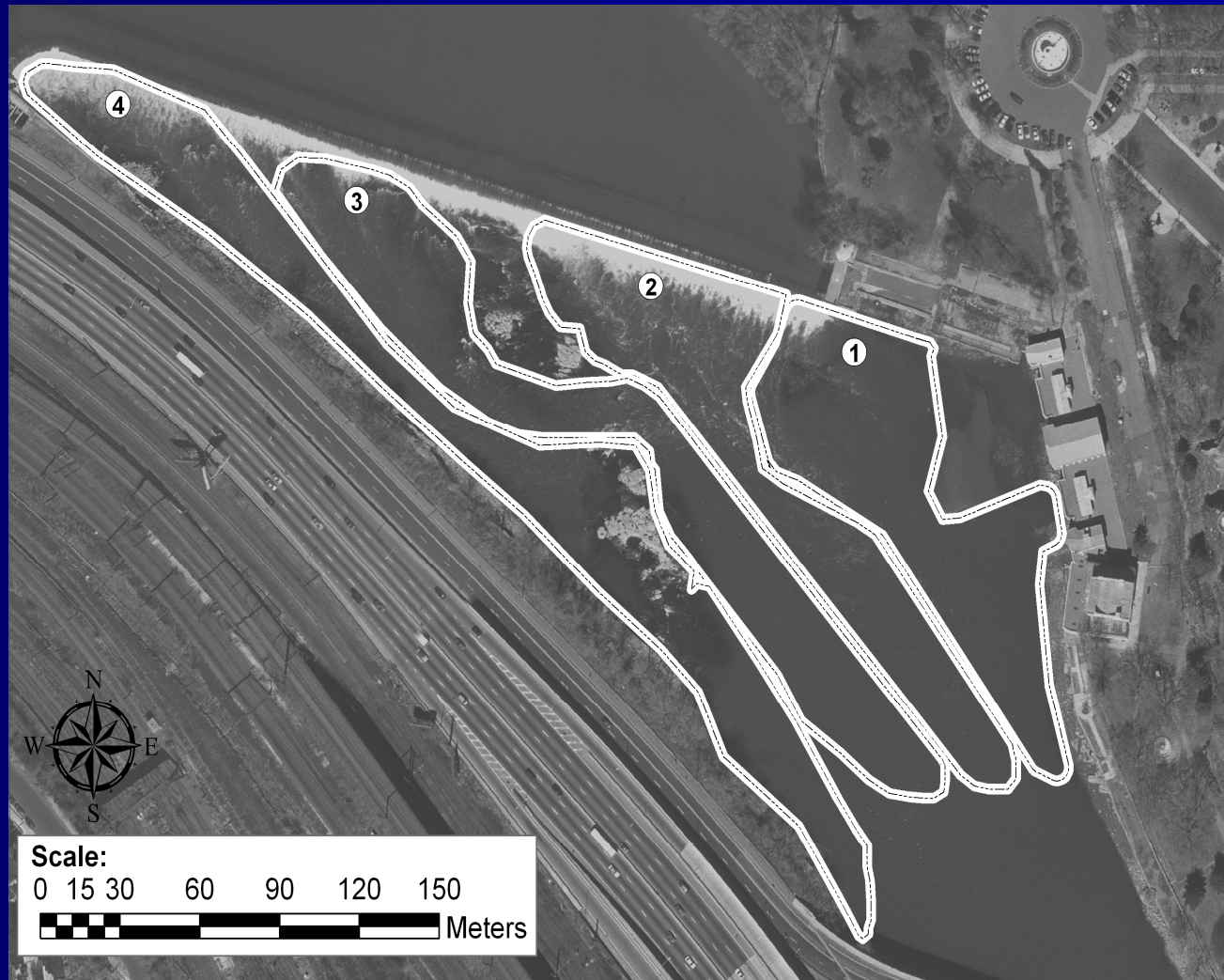


Video Transmission



Fish Sampling Locations

- Four Sampling Stations
- Low Tide Sampling
- Uniform Level Of Effort
- Consistent Electrical Output
- Minimal "Handling"



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Fish Surveys



Weight Measurements

Fish Surveys



Species Identification, Sex & Length Measurements

Fish Surveys



DELTA Observations

Preliminary Results:

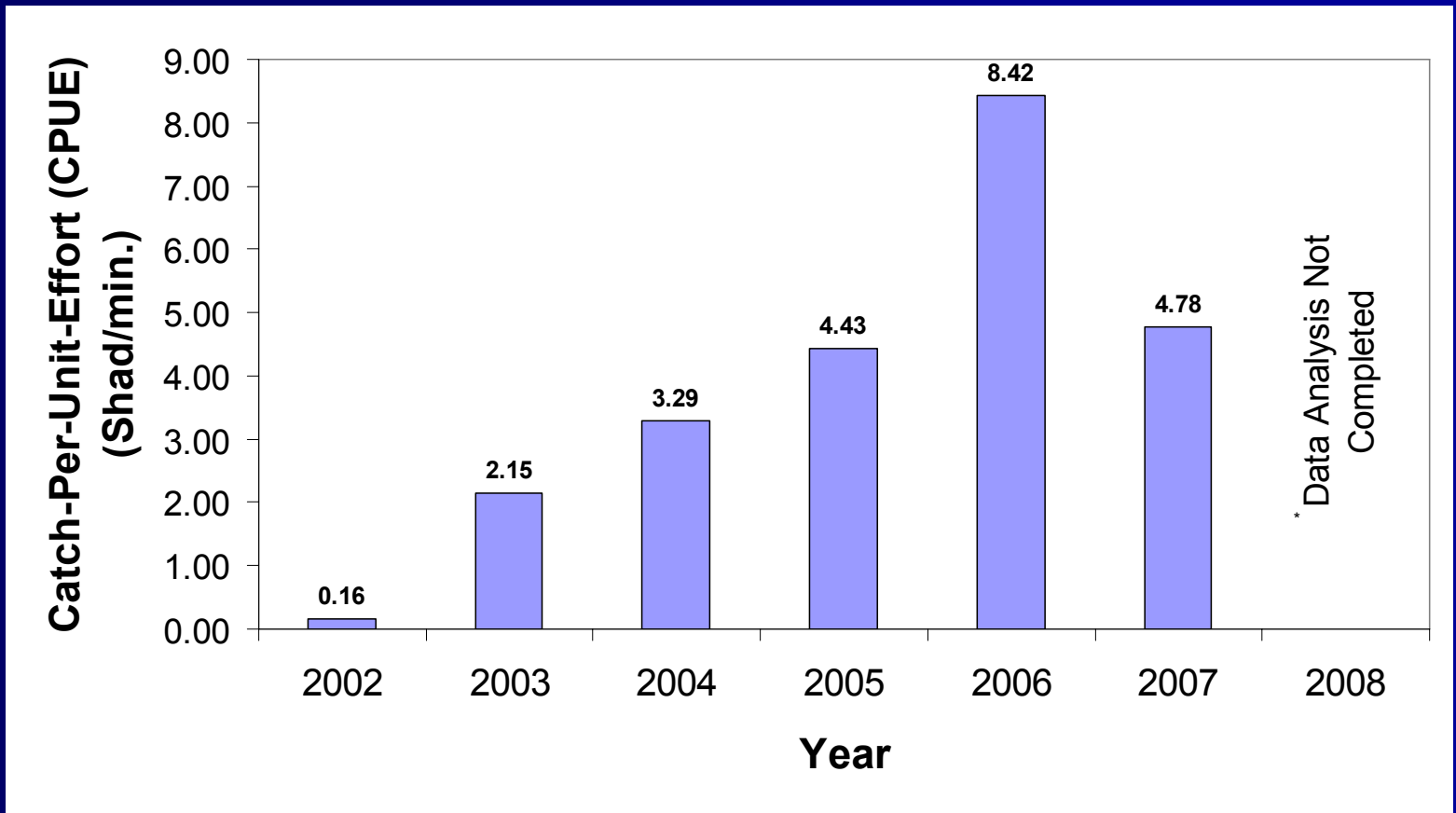
Pre-Restoration (2002-2008)

■ Overview

- 34 species of fish surveyed below the fish ladder between 2002-2008.
- 27 species observed passing through the fish ladder.
- 5 anadromous species observed using the Fairmount Fish Ladder

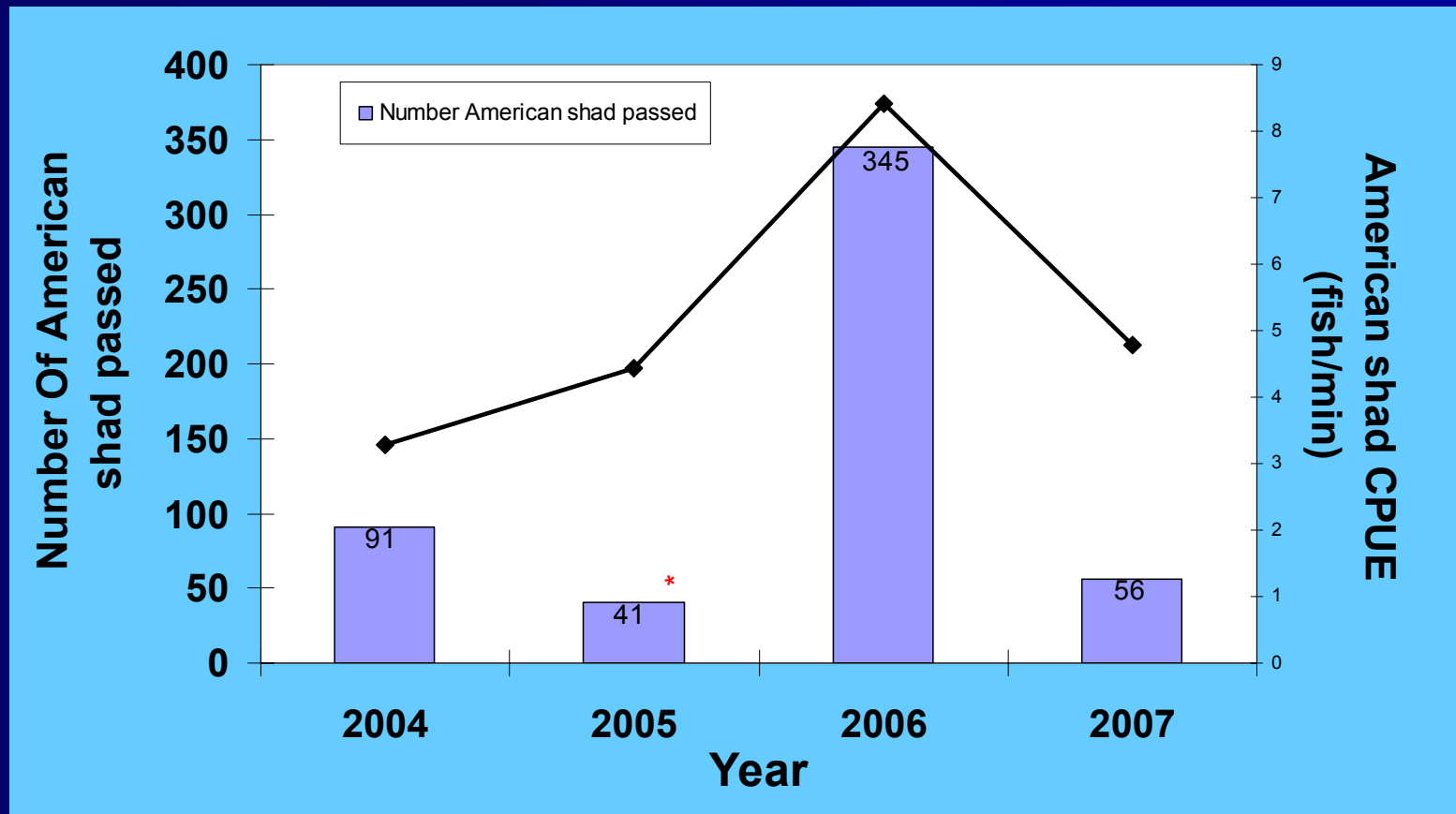


Preliminary Results: *Pre-Restoration (2002-2008)*



Tidal Schuylkill River Fish Survey Results

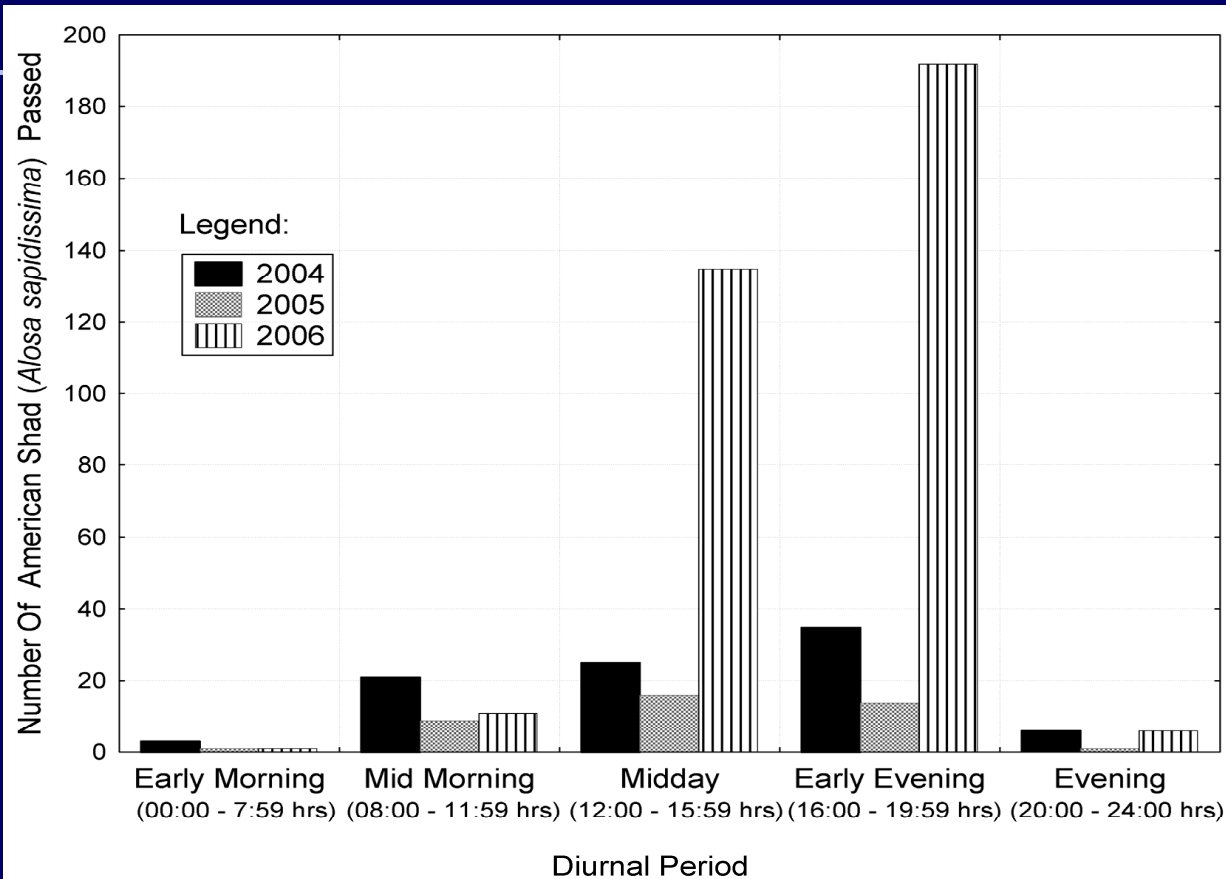
Preliminary Results: *Pre-Restoration (2002-2008)*



Video Surveillance Results

* Power outage

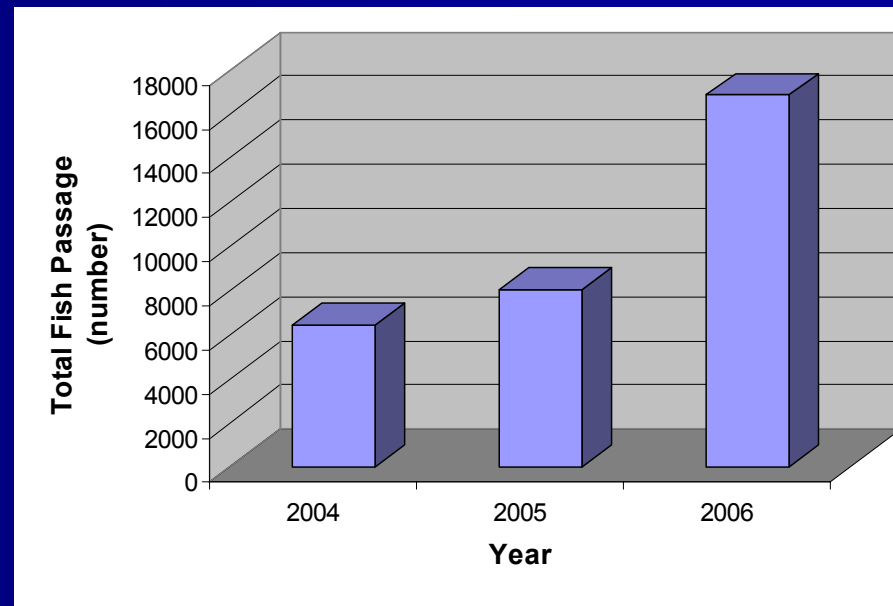
Preliminary Results: *Pre-Restoration (2002-2008)*



Temporal Variability In Fish Passage

Preliminary Findings: *Pre-Restoration (2002-2008)*

- Fairmount Fish Ladder
 - Total fish passage numbers have steadily increased
 - Operation & Maintenance
 - Resident fish species are utilizing the passage facility with seemingly minimal difficulty
 - Initial design of fish ladder was not “optimized” for passage of American shad and other migratory species



Where Are We Now?

- Restoration of the Fairmount Fish Passage Facility is near completion



5/14/2002



12/1/2008

Where Are We Now?

- Major structural modifications



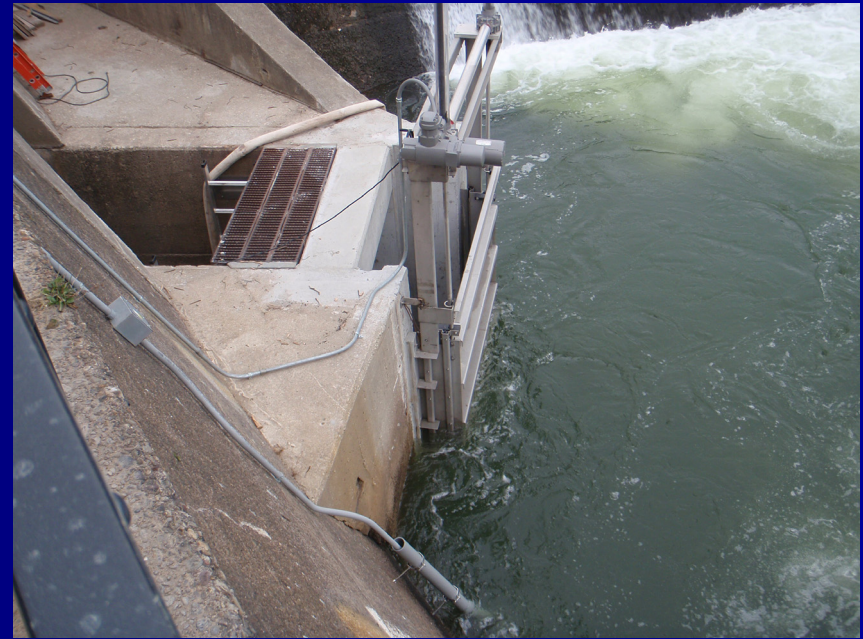
New chambers

Where Are We Now?

- Major structural modifications



Before



After

New entrance channel with automated gate system

Where Are We Now?

- Major structural modifications



Before

New "Non-Overflow" section of fish ladder

Where Are We Now?

- Major structural modifications



After

New "Non-Overflow" section of fish ladder

Where Are We Now?

- Major structural modifications



Before

New exit channel with attraction flow system and debris deflection system

Where Are We Now?

- Major structural modifications



After

New exit channel with attraction flow system and debris deflection system

Where Are We Now?

- Public Education & Outreach



www.fairmountwaterworks.org

Creation of an outdoor classroom and public viewing system

QUESTIONS?



The Good
(Striped Bass)



The Bad
(Flathead Catfish)



...and The Ugly
(Snakehead)