

Demolition
Supervised By
Philadelphia District



US Army Corps
of Engineers®

Sponsored By

The
Nature
Conservancy®

Cuddebackville Dam Removal



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New York

Pennsylvania

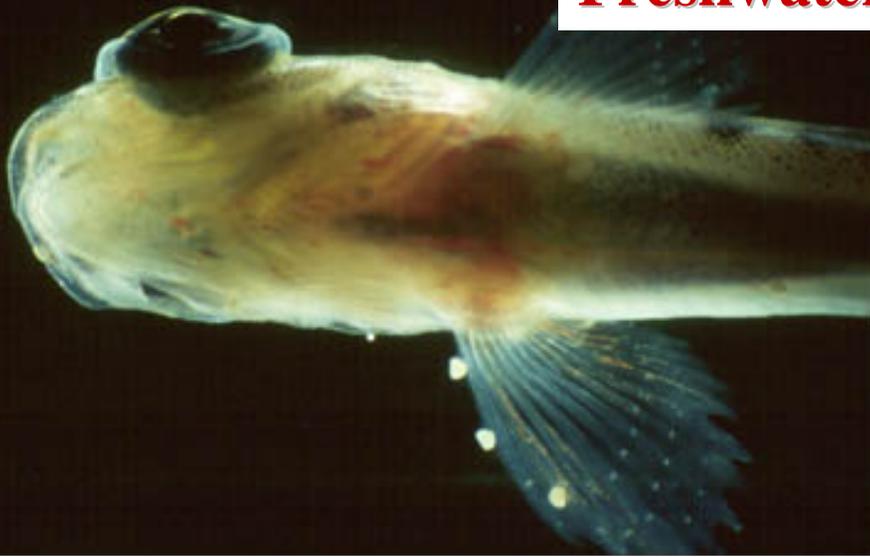
New Jersey

**SULLIVAN
COUNTY**

**ULSTER
COUNTY**

**ORANGE
COUNTY**

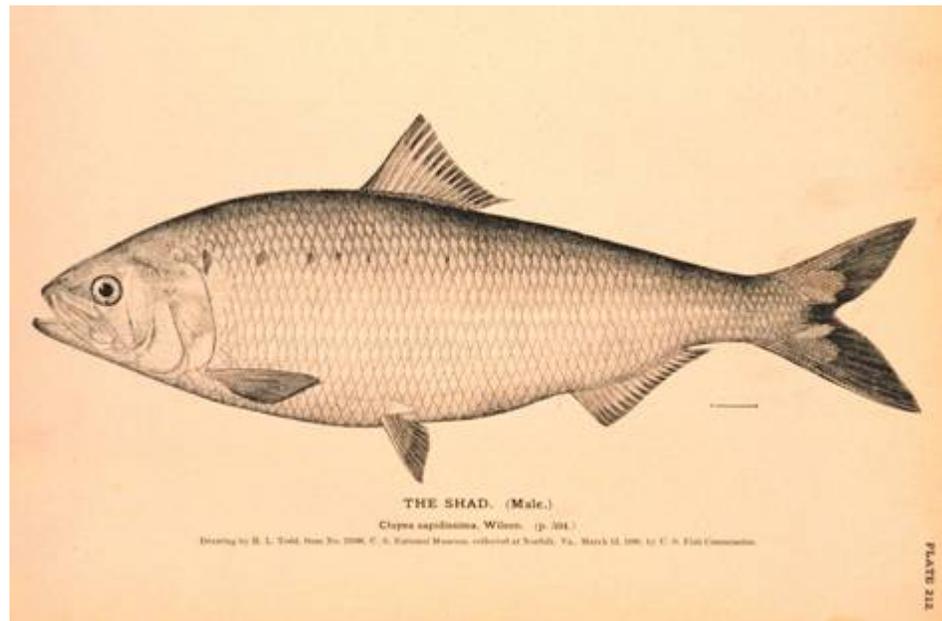
Freshwater Mussels



Diadromous Fish



American Shad





In cooperation with the
Town of Thompson

Mussel Community Composition in Relation to Macrohabitat, Water Quality, and Impoundments in the Neversink River, New York

By Barry P. Balducci, George L. Schuler, and Karen Riva-Murray

Open-File Report 02-104

U.S. Department of the Interior
U.S. Geological Survey

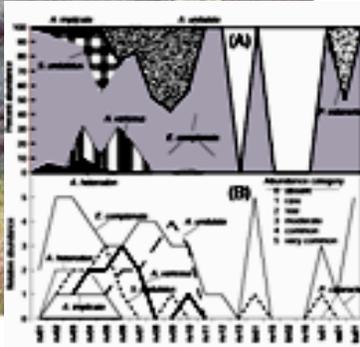


FIG. 2. Mussel community composition (A) and abundance (B) of mussel species collected during surveys of 20 mussel reaches in the Neversink River Basin, N.Y., from July 1997. (A) Relative abundance of mussel species, with legend in the left. Total abundance also indicated in the right. The locations are shown in Fig. 1.1.



Dam Project Summary



- **Cuddebackville Dam:** 2 segments; southwest segment to be removed winter 2003; northeast dam to remain (rock ramp to be installed 2005) for feeder canal
- **SW Dam Vitals:** 5.5 ft high, 107 ft long, pier stop log dam
- Built 1912 for hydropower diversion through canal
- Abandoned 1948, ownership to Orange County
- **Context:** First dam removal for ecological reasons in NY State History

Project Constraints

- Endangered & threatened species 1 mile downstream
- Philadelphia District Corps/TNC first dam removal (learning curve for both)
- New partnership, different organizational cultures
- Cumbersome New York State permitting system for dam removal
- NYS DEC concerned about turbidity, permit required construction in the dry
- TNC does not own dam or land necessary for access
- Difficult access to dam site
- Historic & community concerns about D & H Canal
- Environmental window of late summer (low flows, spawning fish)

Project Summary (*cont'd*)



- **Authority:** Environmental Restoration under Continuing Authorities Program, Section 206 of WRDA 1996.
- **Sponsor:** The Nature Conservancy's Eastern New York Chapter
- **Cost Sharing:** 65%/35% cost share includes work-in-kind.
- **Planning Design & Analysis (PDA) Phase:** Initiated January 2000, completed June 2003. Total cost:\$289,000.
- **In Kind Services:** Sponsor providing \$150,000 in materials and \$449,000 in other project requirements
- **Construction:** Contract awarded June 2003 (\$715,000). Winter shutdown December 2003. Remobilization Summer 2004. Adjustments to contract: \$610,000.



Cuddebackville Dam (Southwest Side)

Project Features



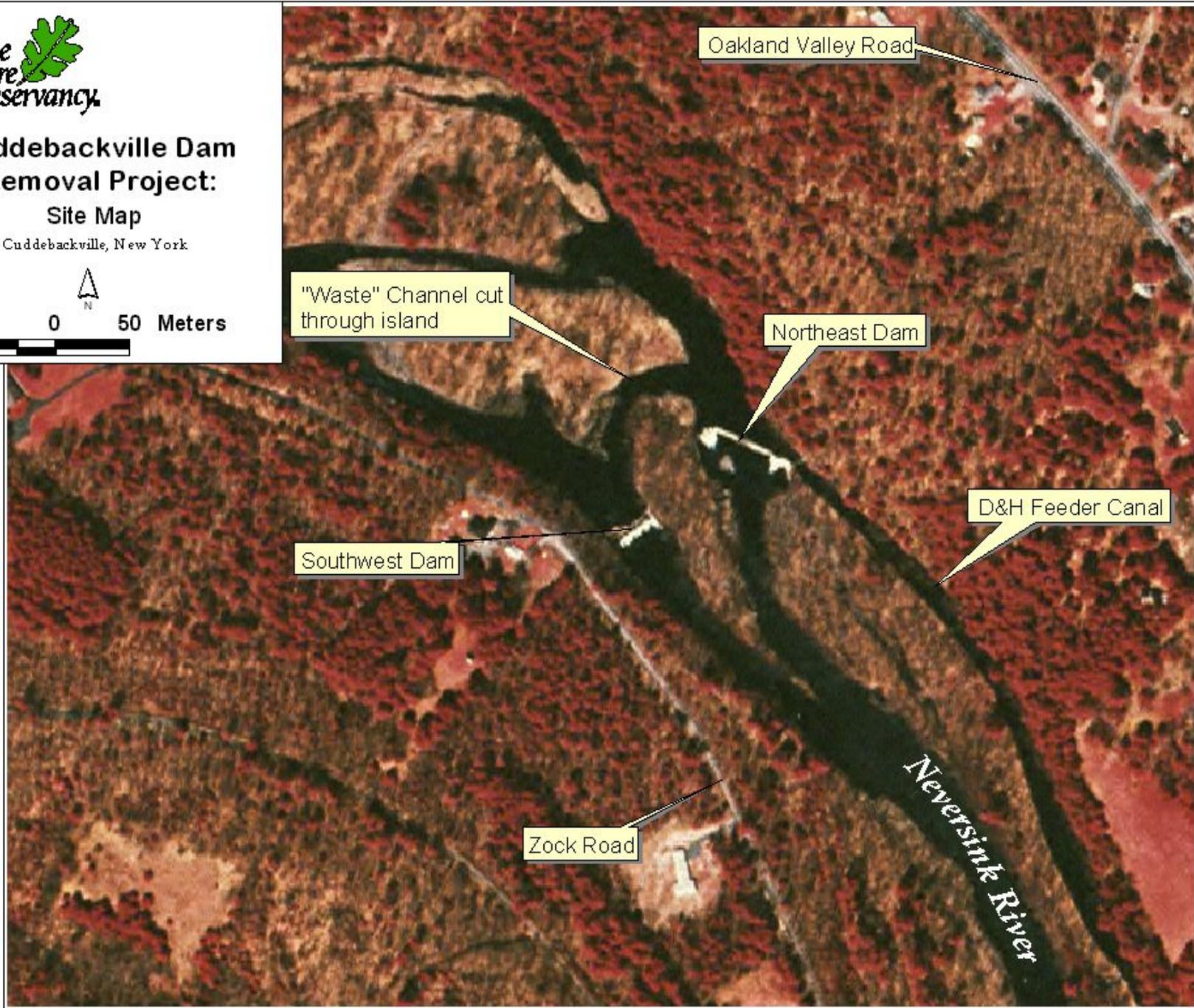
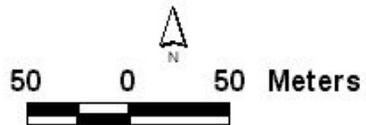
- **Access Road:** Approximately 1 mile access road required
- **Cofferdams:** Two: one upstream, one in impoundment channel
- **Culvert:** Needed where road crosses feeder canal spillway outlet
- **Temporary Bridge:** 65' crossing east channel of Neversink River
- **Dam Removal:** mechanical demolition (excavator with hydraulic hammer)
- **River Restoration & Right Bank Stabilization:** Initial design included shoal removal, bed armoring, abutment removal and bank stabilization
- **Environmental Monitoring:** Includes 3 years pre- and 5 years post-removal monitoring



Cuddebackville Dam Removal Project:

Site Map

Cuddebackville, New York



Oakland Valley Road

"Waste" Channel cut through island

Northeast Dam

D&H Feeder Canal

Southwest Dam

Zock Road

Neversink River

A gravel access road winds through a wooded area. The road is bordered on the left by orange safety fencing and on the right by black erosion control matting. The surrounding trees are bare, suggesting a late autumn or winter setting. The road surface is composed of grey gravel and is partially covered with fallen leaves. The background shows a dense forest of tall, thin trees.

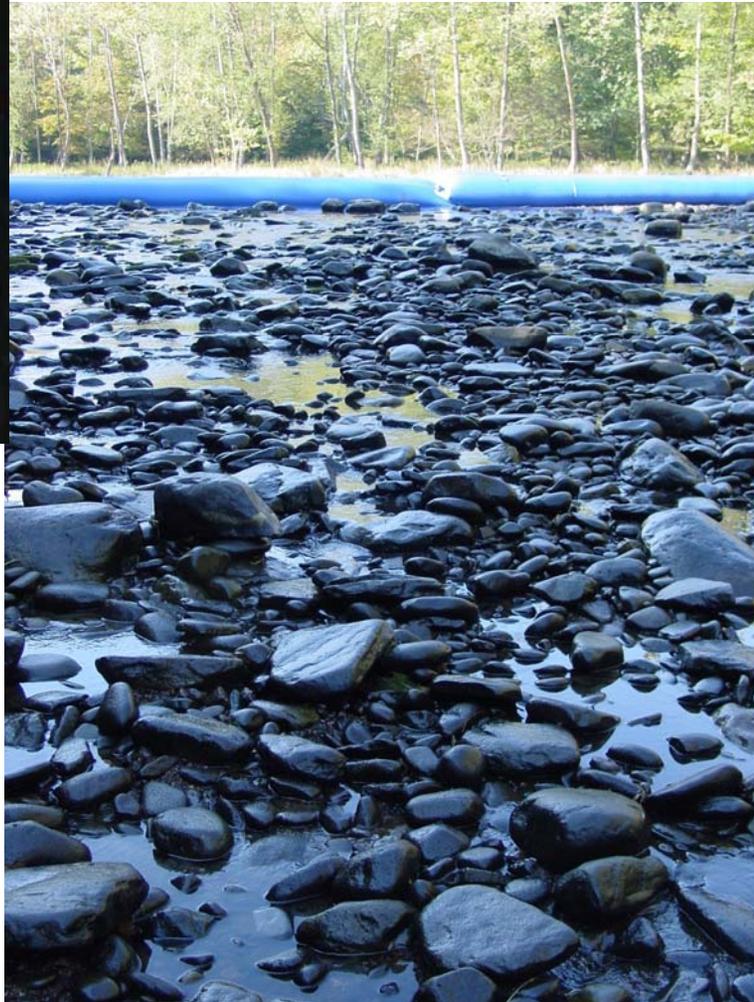
Access Road & Fencing



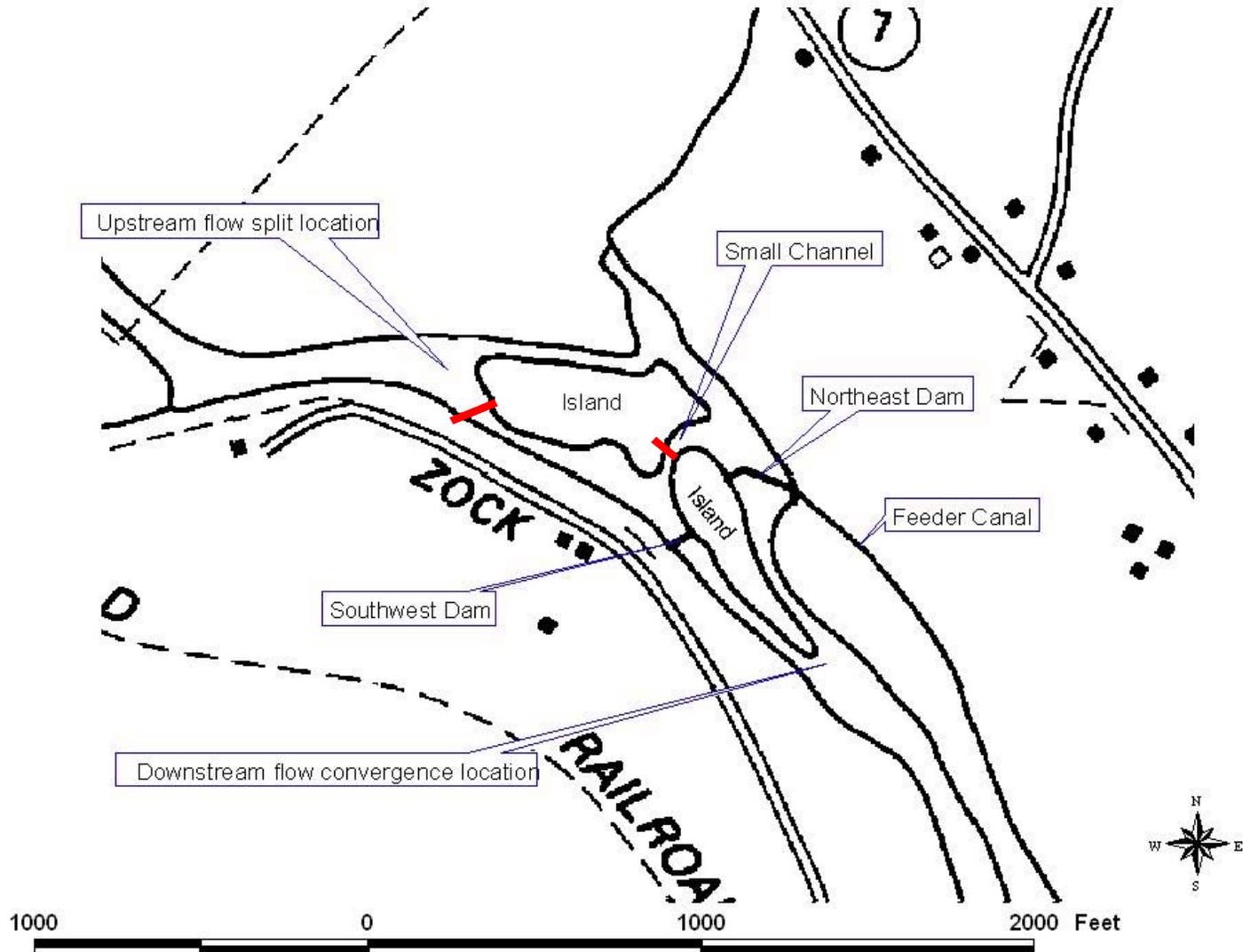
Temporary Bridge Crossing



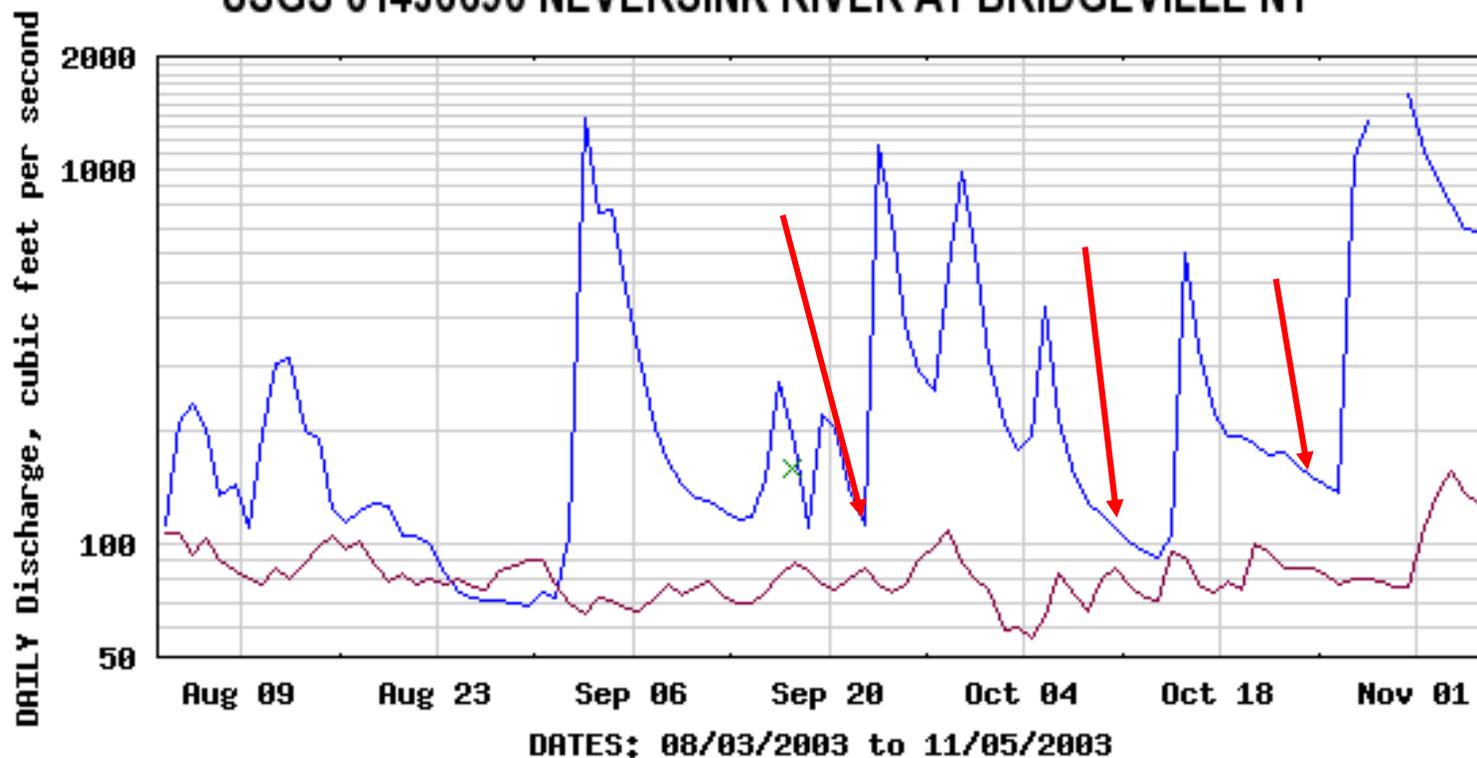
Cofferdams: Take 1



Design Characteristics



USGS 01436690 NEVERSINK RIVER AT BRIDGEVILLE NY



EXPLANATION

- DAILY MEAN DISCHARGE
- MEDIAN DAILY STREAMFLOW BASED ON 10 YEARS OF RECORD
- × MEASURED Discharge

Provisional Data Subject to Revision

Year: 2003

High Flows



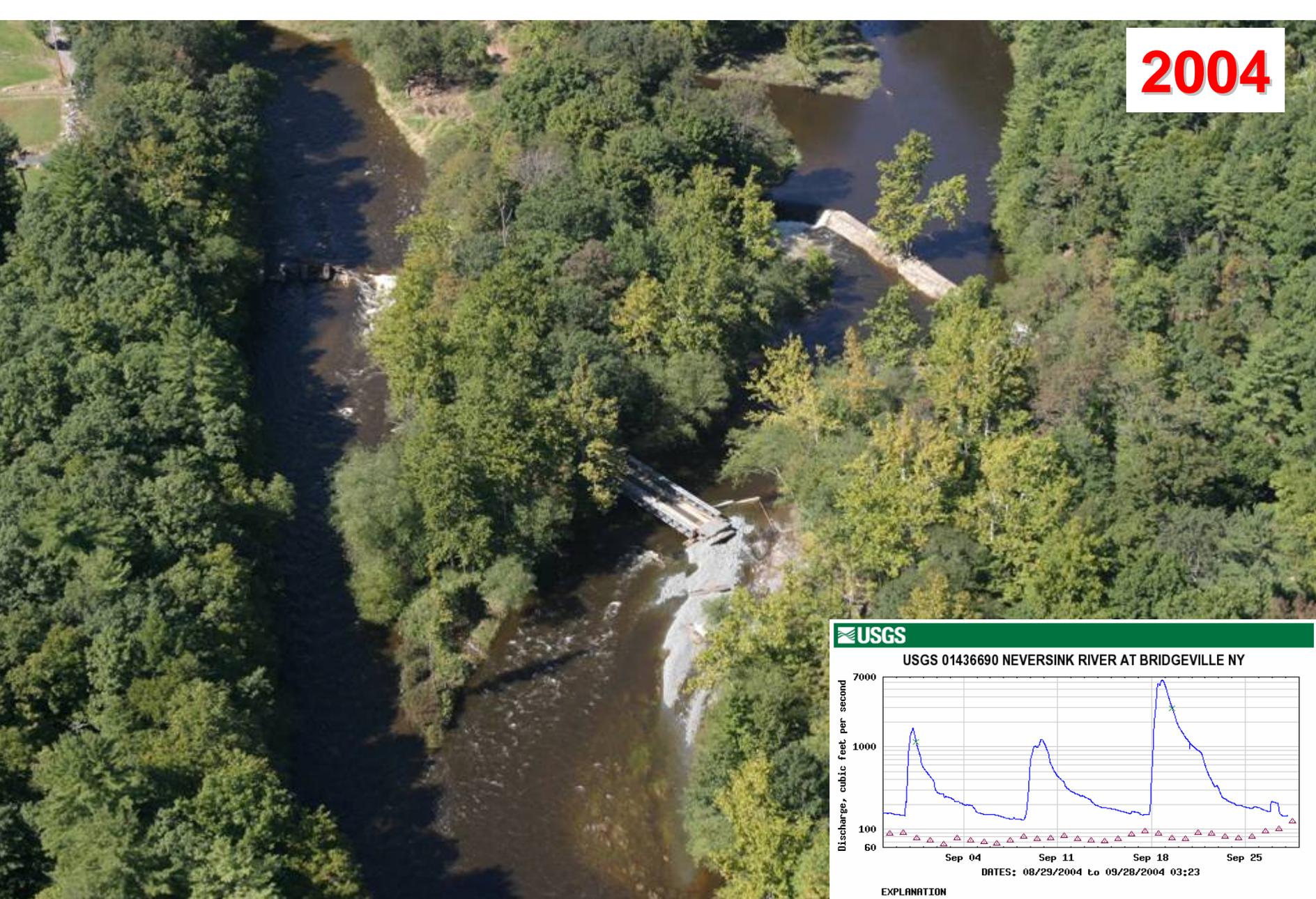
Year: 2003



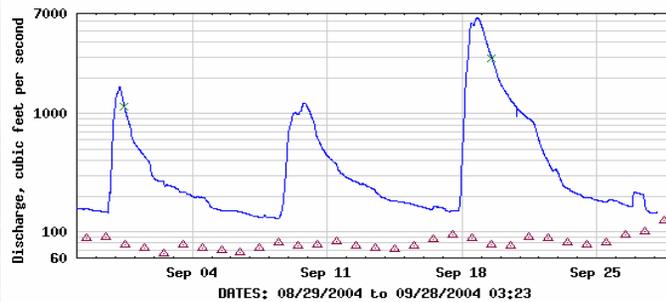
Year: 2003



2004



USGS 01436690 NEVERSINK RIVER AT BRIDGEVILLE NY



EXPLANATION

- DISCHARGE
- MEDIAN DAILY STREAMFLOW BASED ON 11 YEARS OF RECORD
- MEASURED Discharge

Provisional Data Subject to Revision

Year: 2004





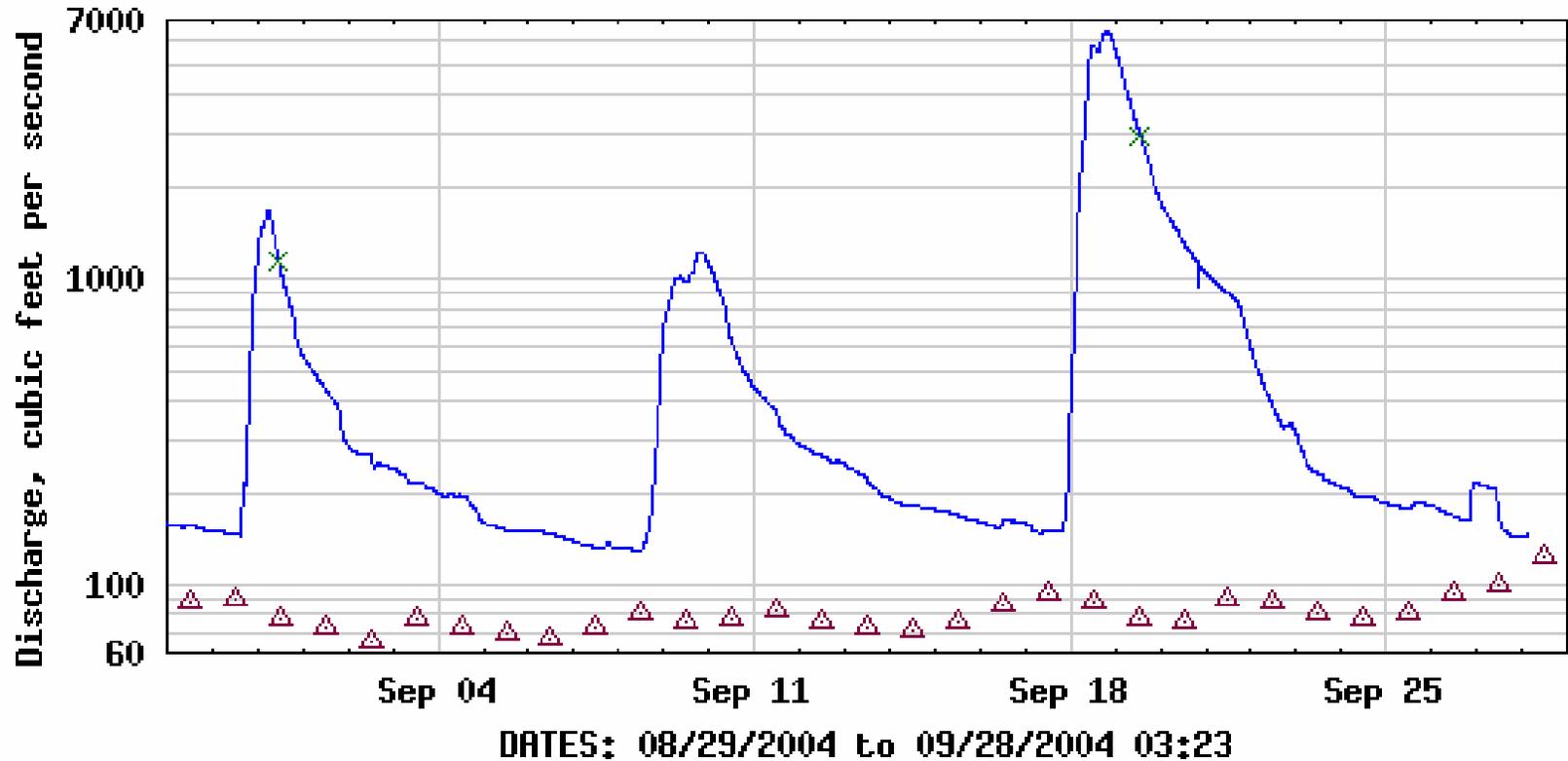
Year: 2004



Year: 2004



USGS 01436690 NEVERSINK RIVER AT BRIDGEVILLE NY



EXPLANATION

- DISCHARGE
- △ MEDIAN DAILY STREAMFLOW BASED ON 11 YEARS OF RECORD
- × MEASURED Discharge

Provisional Data Subject to Revision

Year: 2004





Year: 2004



Year: 2004



The New York Times

Dam Builder In New Role: Dam Breaker

By IAN URBINA

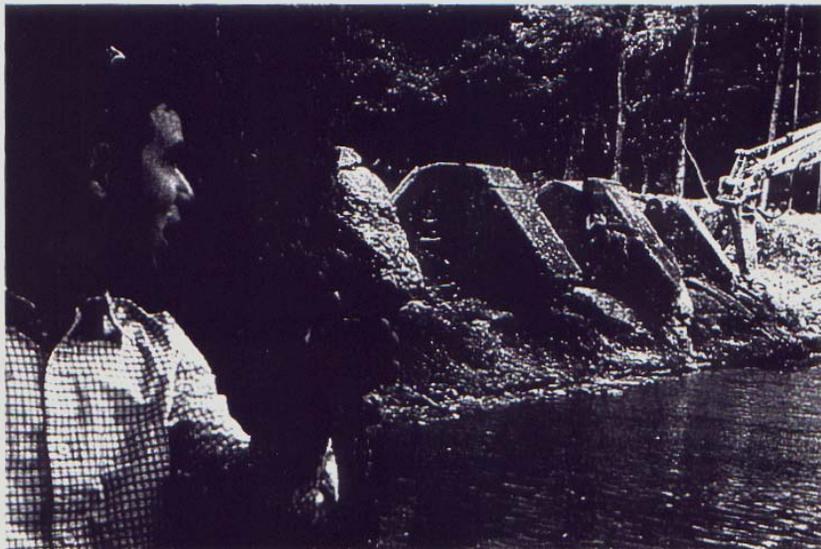
Tucked away in Orange County, N.Y., a 90-year-old dam will start coming down today. Piece by piece, a team of engineers from the Nature Conservancy and the Army Corps of Engineers will begin removing major parts of the Cuddebackville Dam on the Neversink River as part of a painstaking effort to save an endangered mussel that is blocked by the dam from going upstream.

The project is the first in New York history in which a dam is being removed for purely environmental reasons. It also signals a change of purpose for the Army Corps of Engineers, which has spent more than a century creating dams and now is just beginning to remove them.

"This is a pretty symbolic occasion for us," said Brian J. Mulvenna, project manager from the Army Corps. He said the project is the first in which the corps has worked with a nonprofit organization since a federal law was passed in 1999 allowing such partnerships.

"It also shows a changing of the guard at the corps," Mr. Mulvenna said, "as the older generation of dam supporters give way to a younger group who are often dam opponents."

Built in 1915, the dam diverted water down the Delaware and Hudson canal system to turn turbines at a power plant in Cuddebackville, about 65 miles northwest of New York City. But the dam became a ves-



Tara Engberg for The New York Times

Demolition to Help Endangered Mussels

cause most fish swim up the southwest side.

The depth of the river, about four feet, and its speed will not change when the dam is removed, Mr. Schuler said. But American shad and native brook trout will again be free to swim upstream in the Neversink River, where fly-fishing became popular in the United States. But the biggest beneficiary will be the dwarf wedgemussel, a tiny freshwater mussel no bigger than a quarter and one of the most endangered species in upstate New York. While the wedgemussel, which helps purify the water, does not swim upstream, host fish carrying its larvae do.

The removal of the steel-reinforced concrete dam, 6 feet tall and 125 feet across, is expected to be completed by the end of October at a cost of about \$2.2 million. The conservancy is paying for 35 percent, and

concrete.

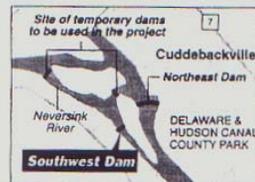
The fish and mussels from the side of the island that is now dry were relocated upstream. Once the dam is removed, the streambed will be restored and water will be released from behind the cofferdam. A second, smaller, cofferdam was built to block an artificial trench that divides the island in two. The trench used to direct water from the southwestern side of the island to a canal system on the northeastern side.

"American dams are not the pyramids of Egypt, and they were not meant to stand forever," said Amy Souers Kober, a spokeswoman for American Rivers, a conservation group based in Washington, D.C. "Many states are starting to realize that river restoration starts with dam removal since that is the only way to open the flow to aquatic life."

Ms. Souers Kober said there are plans to remove an estimated 60 dams in 14 states and in the District of Columbia in 2004. Only four of these dams ever supplied electricity, and they have been off line for years, she said. Of the 77,000 dams higher than 6 feet across the country, fewer than 2,500 generate electricity, she noted. Most were built to run mills that are now obsolete, to control floods or to create water supplies or recreational lakes.

While sometimes providing useful services, dams drown valuable habi-

Evan Obrien, a park visitor in Cuddebackville, N.Y., looking at a dam that is being taken apart so that the dwarf wedgemussel, an endangered species, can go upstream. The Nature Conservancy and the Army Corps of Engineers are handling the project.

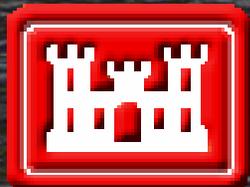


Lessons

- TNC is a different type of “sponsor” (greater involvement requires more communication)
- Different project management challenges (both TNC and USACE)
- Careful selection of contractor (don't rush)
- 206 Aquatic Restoration Program oversubscribed in FY04 (adequate funding and prioritization needed)
- At all stages, simplify to dodge Murphy's Law (e.g., coffer dam type)

Overarching Issues

- TNC/USACE partnership, different organizational cultures
- How do we overcome the challenges & risk inherent in engineering for dynamic, natural systems?
- How do we maintain consistent team throughout process which shares ecological goals of project from design through construction?
- How do we leverage restoration experience of ERDC and others?
- How can we streamline decision making process for changes in design that arise from unexpected on-site conditions?
- Can we improve cooperative work on small restoration projects by using smaller, fully integrated project teams?



US Army Corps
of Engineers®

*The Nature
Conservancy*®



SAVING THE LAST GREAT PLACES ON EARTH