



# ENGAGING YOUTH ON SHAD SAMPLING ON THE BRANDYWINE RIVER

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# Brandywine Shad 2020

RESTORING THE PHENOMENON OF  
MIGRATORY SHAD TO THE BRANDYWINE RIVER



# BRANDYWINE SHAD 2020

- Founded in 2017 for the purpose of restoring the phenomenon of migratory shad to the Brandywine River

## DIRECTORS

- H. Hunter Lott III
- James B. Shanahan

## FOUNDING MEMBERS

- Brandywine Conservancy
- Hagley Museum & Library
- University of Delaware Water Resources Center

## SUPPORTING ORGANIZATIONS

- American Rivers
- Brandywine Red Clay Alliance
- Delaware Nature Society
- NOAA
- Partnership for The Delaware Estuary
- Stroud Water Research Center
- The Conservation Fund
- The Nature Conservancy
- US Fish & Wildlife / NFWS

# ANTICIPATED BENEFITS

- ❖ Increase population of anadromous fish by enabling the migration of American shad, hickory shad, and river herring
- ❖ Improve water quality by lowering costs for water purification
- ❖ Increase in ecological diversity of river corridor and surrounding area
- ❖ Increase recreational use: fishing, kayaking and canoeing
- ❖ Economic development through increased tourism related to recreational use
- ❖ Educational programs for Youth



# **ALOSA SAPIDISSIMA**

## **AMERICA'S FOUNDING FISH**

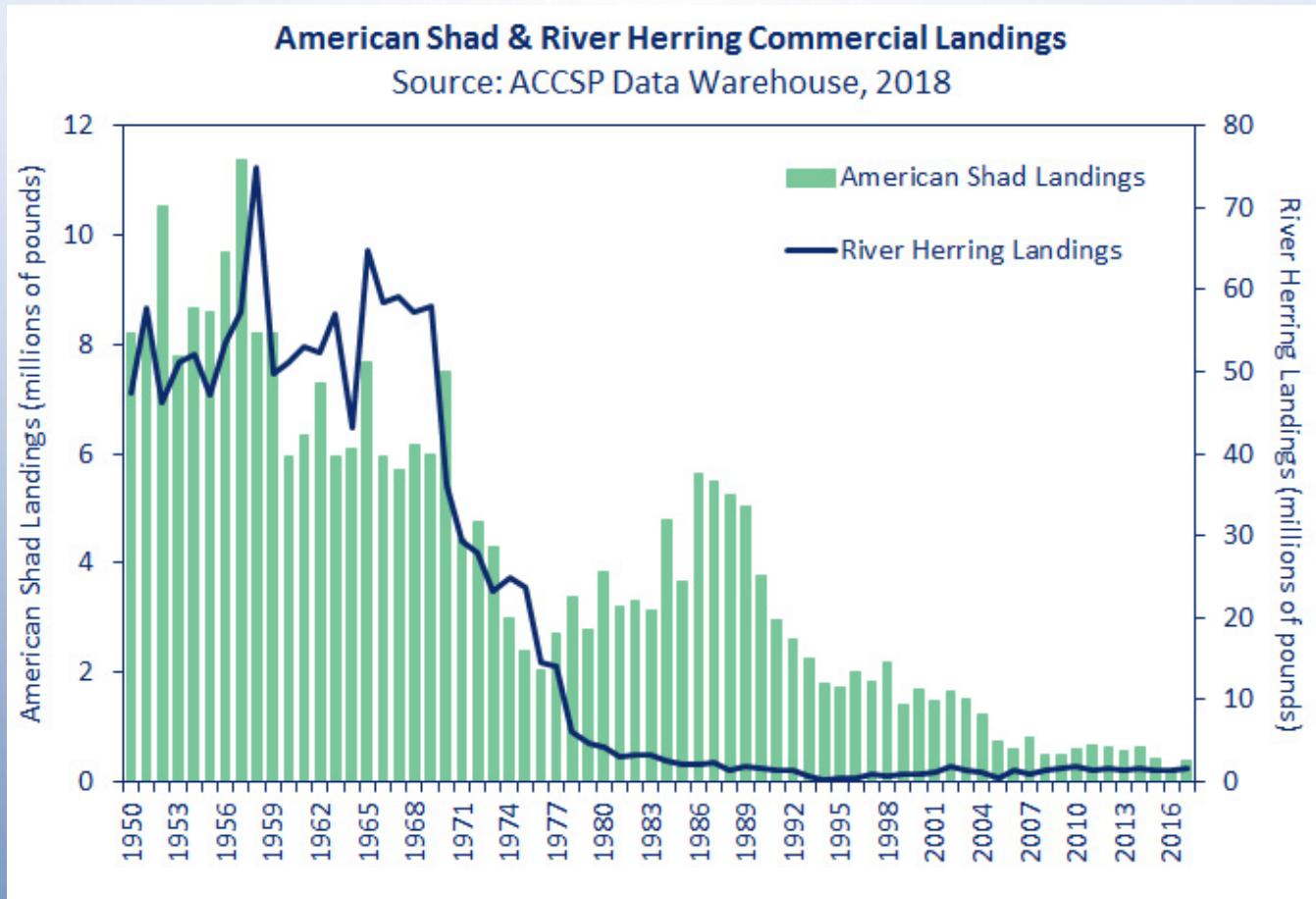
- Key role in colonial America
- Boiled, fried, baked or preserved by drying, smoking, pickling and salting
- Sustained Washington's troops at Valley Forge
- Major source of commercial fishing in 19<sup>th</sup> Century



Commercial shad fishing on Susquehanna River, 1900

# DECLINE IN SHAD HARVEST

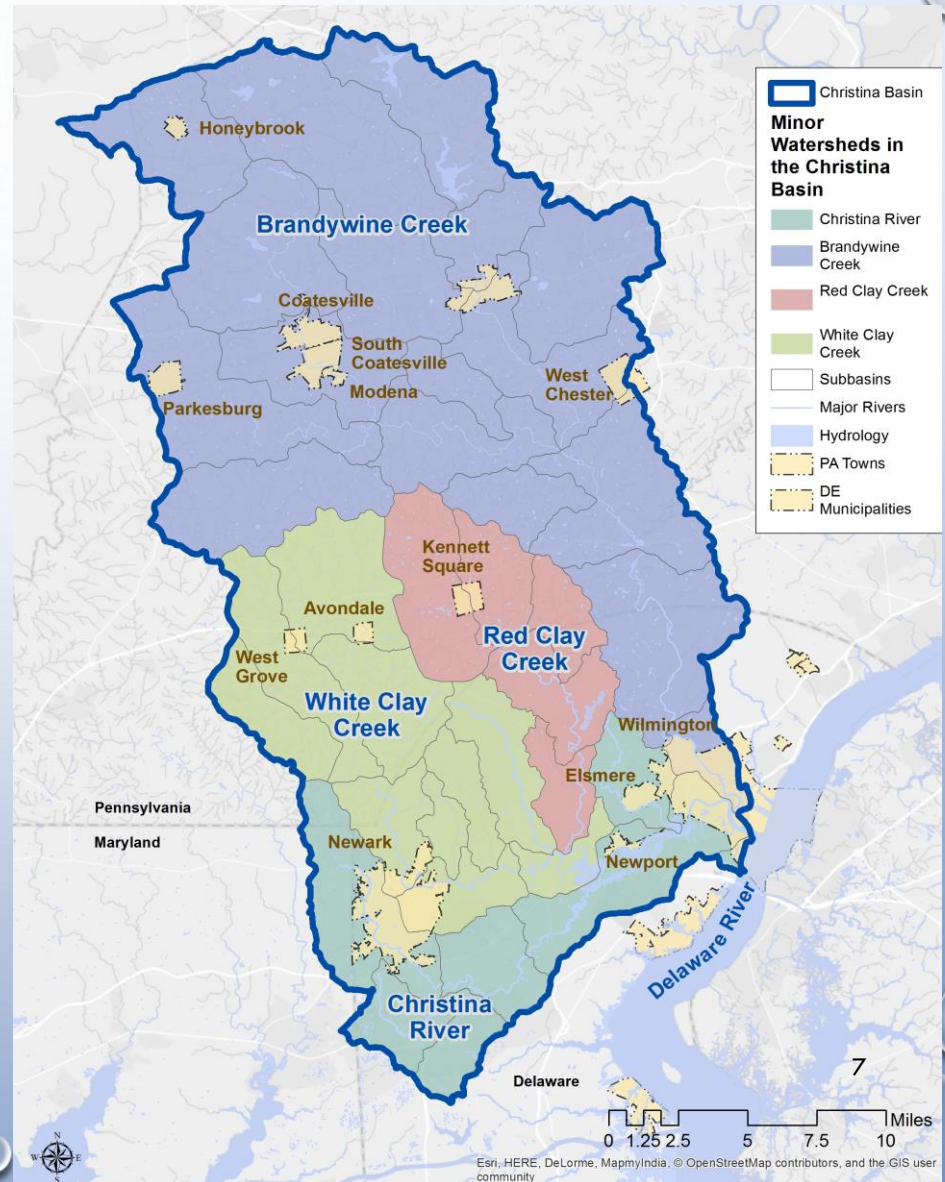
From 10 million pounds in 1950 to 800,000 in 2016





# BRANDYWINE WATERSHED

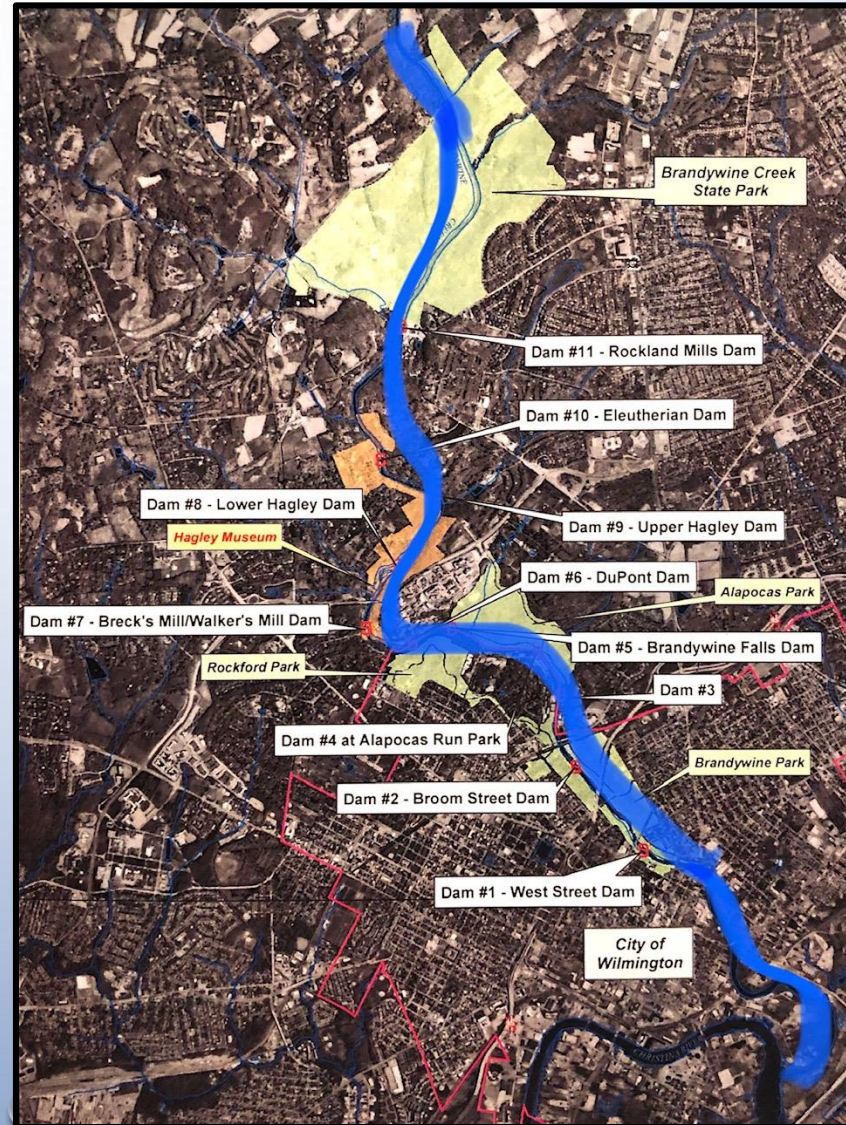
- ❖ One of 4 watersheds in Christina Basin
- ❖ Sourced in Welsh Hills near Honey Brook
- ❖ 60 miles long, 330 square miles
- ❖ 85% in PA, 15% in Delaware
- ❖ Empties into Christina 1 mile from Delaware River
- ❖ 30 million gallons a day water supply for Wilmington, Coatesville, Downingtown and West Chester and neighboring communities





# BRANDYWINE DAMS

- ❖ 11 dams in Delaware
- ❖ 15 miles long
- ❖ 138 foot vertical drop
- ❖ Many scenic and historical areas
- ❖ Thousands of acres of public and protected land
- ❖ First State National Historical Park designation in 2015
- ❖ Recreational use for fishing, hiking, canoeing, kayaking, tubing
- ❖ Fish advisories for PCB's and dioxins





# DAM #1 REMOVAL



# Examining Diadromous Fish Passage in Brandywine Creek



# What is a diadromous fish?

- Fish that spend portions of their life cycle in fresh water and a portion of their life cycle in salt water
  - Atlantic Sturgeon – Endangered
  - Atlantic Striped Bass – Overfished coastwide
  - American Shad – Unsustainable in Delaware River Estuary
  - River Herring – Depleted in Delaware River Estuary



# What is Fish Passage?

- Fish passage - the ability of fish or other aquatic species to move throughout an aquatic system among all habitats necessary to complete their life cycle (USFWS 2020)
- Sometimes, fish can't reach their spawning grounds because of man made obstructions
  - Dams
  - Culverts
- More than 2 million dams and other barriers block fish from migrating upstream (NOAA 2020)
  - As a result, many fish populations have declined
- Diadromous fish need to migrate through bays, estuaries and up/down rivers to migrate to spawning grounds
  - American Shad have been found to be negatively impacted by barriers to fish passage



Photo Credit: NOAA 2020



# Where is Brandywine Creek?

# Brandywine Creek



# Christina River

# Delaware River

## Dam #2



How are we examining fish passage on Brandywine Creek?





# American Shad are using Brandywine Creek above former Dam #1



- **Juvenile and Adult American Shad found just below Dam # 2 demonstrating that the removal of Dam #1 opened up new available habitat for multiple life history stages of this species**

- American Shad were found on 3 of 6 formal sampling events at the below dam location suggesting our survey effectively captured this species
- American Eel found above Dam # 2
- 16 Species total found in our samples







## Why it's important to me..

Working on this was really important to me because I want to become a marine biologist when I am older and this gives me experience that I may need. I also live close by the park and having the shad population increased would help the ecosystem very much. The dam being taken out has made the water look cleaner and I even feel that some life is coming back to the brandywine river.

# My Experience

During my time helping with this project I helped take the net out in the water. With the help from 3 other people we took the net into the water and pulled the net in an arc so we could pull the two ends together and bring them back onto land. At the first area we would do we caught a lot of sunnies and bass and once even an eel. I learned the difference between similar looking fish and other ways to characterize certain species of fish. I had a really great time and i think i learned a lot.



# Youth Engagement

1. Youth with scientific interests can...
  - a. Do a class project on this program
2. Kids can get other kids to join
3. Summer camp day activity
4. Brandywine River clean up