

## **Summary of Brandywine River Dam Modification Project**

Brandywine Shad 2020 and their partners are looking to modify up to 10 existing dams on the Brandywine River over an approximately 5-mile stretch of the River from West Street in City of Wilmington to Brandywine State Park in Wilmington and the adjoining portion of New Castle County. Modification is a broad term and is broken down into two potential modification options for the dams: dam breach and construction of a fish passage. The selection of these options takes into account the current condition and use of the dams, and are discussed further in the summary of each dam.

Regardless of the proposed dam modification, this project can only be successful if all 10 dams are modified. Universally, each dam modification project would require:

- Detailed survey;
- Historic assessment of dams;
- Permissions or agreements with dam owners;
- Permission/easements or access agreements with public and private land Owners;
- Numerical modeling of river elevations and associated floodplain;
- Environmental Impact Assessment and Report;
- Local, County, State and Federal permitting; and
- Construction drawing and bid document preparation.

### Dam 1: West Street Dam

The West Street Dam appears to be a combination of parged stone and concrete, approximately 2 to 4 feet high. A “stepped” breach is apparent in the center section of the dam. The topographic conditions and development surrounding the dam will make construction equipment access to the dam challenging. Modification of the breach to support fish passage this dam appears to be an appropriate option.

### Dam 2: Broom Street Dam

The Broom Street Dam appears to be concrete and is approximately 6 to 8 feet high and is used to maintain a sufficient water level in the River to support raw water intake by the City of Wilmington. There is water intake upstream of the dam along the eastern side of the River. In addition, a mill race on the western side of the river channels water to the City water filtration plant. Given that this dam supports the main drinking water intakes for the City of Wilmington, breaching the dam is not an option, but a fish passage could be constructed. The dam appears to be accessible by construction equipment through a park on the eastern side.

### Dam 3: Currently Breached

#### Dam 4: Alapocas Run Park Dam

The Alapocas Dam appears to be double-step concrete and is approximately 7 to 9 feet high. The dam has concrete wing walls and Alapocas Run enters Brandywine River just downstream of the dam on the eastern side. The dam is accessible by construction equipment through either side and this dam may be a candidate for either a passage or breaching.

#### Dam 5: Brandywine Falls Dam

The Brandywine Falls Dam appears to be a combination of stone and concrete and is approximately 6 to 8 feet high. There is a private community and millrace on the western side of the dam and access to the River from the eastern side will be very challenging due to the topography. Breaching this dam appears to be an appropriate option.

#### Dam 6: DuPont Dam

We were not able to access the DuPont Dam during our site visit, but based on the general characteristics of the other dams observed, it most likely is constructed of a combination of stone and concrete. The dam may be accessible through the DuPont Experimental Station. Breaching this dam appears to be an appropriate option.

#### Dam 7: Brecks Mill Dam

Brecks Mill Dam appears to be approximately 3 to 5 feet high and constructed of a combination of stone and concrete. Buildings are constructed immediately adjacent to the dam on both sides of the River; therefore construction of a fish passage at either end of the dam is unlikely. While breaching the dam might be the best technical option, breaching may not be feasible due to the historic context. A “naturalized” fish passage over the dam structure may be a viable option to minimize impact to the historical context.

#### Dam 8: Lower Hagley Dam

The Lower Hagley Dam appears to be approximately 5 to 7 feet high and constructed of a combination of stone and concrete. The dam is most accessible through the Hagley Museum property on the western side of the River. Given the historic surroundings of the dam, breaching the dam may not be feasible. Similar to Brecks Mill Dam, a passage over the dam structure might be a viable option that would maintain the historical context of the site.

#### Dam 9: Upper Hagley Dam

The Upper Hagley Dam appears to be approximately 5 to 7 feet high and constructed of a combination of stone and concrete. This dam is unusual as the western portion of the dam extends on an approximate 45 degree angle to the course of the River and then turns at the approximate midpoint to extend at a more conventional 90 degree angle to the course of the River to the eastern side. The 90 degree portion of the dam appears in disrepair as compared to the rest of the dam. The dam is most accessible through the Hagley Museum property on the western side of the River. Given the historic surroundings of the dam, breaching the dam may not be feasible, unless it could be incorporated into the portion of the dam that is in disrepair. As with the other historically significant dams, a sensitively designed fish passage over the dam structure might also be a viable option for this location.

#### Dam 10: Eluetherian Dam

The Eluetherian Dam is a unique, historic dam that is constructed with a timber spillway and was reconstructed within the past 15 years at a cost of \$1,000,000 to the Hagley Museum. There is a millrace on the western side of the River and a channel on the eastern side. Flow through these structures is supported by the dam. Given the historic, unique nature of the dam, the mill race and perhaps the channel, a fish passage appears to be the most feasible option for this dam. Past discussions with Hagley suggests that a passage that incorporates the existing millrace may be a viable option at this site.

#### Dam 11: Rockland Mills Dam

Rockland Mills Dam is located within Brandywine State Park and appears to be 4 to 5 feet high. The dam is in disrepair and is partially breached on the western side. Given the condition of the dam, additional breaching of the dam to support fish passage appears to be a feasible option.