

Chesapeake Fish Passage Prioritization Tool: Data Updating

1 Data Management and Tool Updates

One of the characteristics of aquatic connectivity analyses that utilize metrics based on river networks is their sensitivity to changes or errors in the data. For example, any metric calculated for the upstream functional network of a dam (e.g., upstream network length, forest cover in the riparian zone of the upstream network, etc.) will be impacted if the next upstream dam is removed. This sensitivity, coupled with the potential for data processing to introduce errors (e.g., see Section 3.3 on snapping dams), increases the importance of regular data updates so that the tool is as accurate as possible and reflects data changes due to both on-the-ground actions as well as error fixes.

In the original version of the tool, edits to the core source datasets (dams, natural barriers, and anadromous fish habitat) were collected over time via email submissions from workgroup members. For example, a workgroup member with direct knowledge of a dam removal would send an email to TNC with the relevant information such as the dam name, dam ID, and the date of removal. These emails would be collected and retained until time and funds were available to run an update which typically occurred after receipt of a new grant and over time periods of a year or more.

In the 2019 revision of the Tool, substantial back-end work was undertaken to streamline and automate the data updating process. This new system allowed authorized users to make edits to the core source datasets via a dedicated data editing portal.

In practice, however, the frequency of data edits submitted by users was not frequent enough to warrant maintaining a near-real-time system of weekly updates to the tool.

1.1 Southeast Aquatic Resources Partnership (SARP) Aquatic Barrier Prioritization Tool

Concurrently, the Southeast Aquatic Resources Partnership (SARP) has been funded by the United States Fish and Wildlife Service (USFWS) to develop a national aquatic barrier database and prioritization tool (<https://aquaticbarriers.org/>). Discussions were held with the Steering Committee to determine the extent to which the forthcoming SARP tool will overlap with the Chesapeake Fish Passage Prioritization Tool. It was decided that while there is substantial conceptual overlap, the prioritization approach used in the Chesapeake tool has been vetted by and is familiar to the fish passage community in the Chesapeake watershed. Further, much of the functionality that is included in the Chesapeake Tool will not be available in the SARP tool at present (e.g., tracking miles opened over time, custom prioritizations, and mapping an upstream functional network for a user-defined point). To that point, SARP has been clear that

they are not trying to, nor would they be able to, incorporate all functionality from regional-scale tools in their national-scale work. Therefore, the Chesapeake Tool will remain an important resource for the regional fish passage community for the foreseeable future. At the same time, there was value seen in having the two tools “talk” to each other. All involved have an interest in each tool using the best available data and not conflicting with each other. The solution that emerged was for SARP to take over the barrier data management for the Chesapeake Bay watershed. As managers of the data, they will incorporate national-scale edits to data on a regular basis. This includes collecting dam removal information from partners (e.g., American Rivers) and updated data from the U.S. Army Corps’ National Inventory of Dams. They also host an editing portal where authorized users can edit data. When updates to the Chesapeake data are made, a scripted process is used (Python, using Esri’s arcpy module) to extract the data from the SARP database for the Chesapeake and format it for use in the Tool. The data is then plugged into the existing process that updates the metrics, runs the prioritization, and updates the Tool resources (fact sheets, data for download, custom analysis tool, miles opened functionality, and upstream network generation).

1.2 Barrier Data Updates

The core source datasets are hosted by SARP on a USFWS-owned ArcGIS Online account. It is accessed via a [dedicated web mapping application](#) that is only accessible to authorized users. Edits made in the portal are automatically tracked by user and the date of edit.

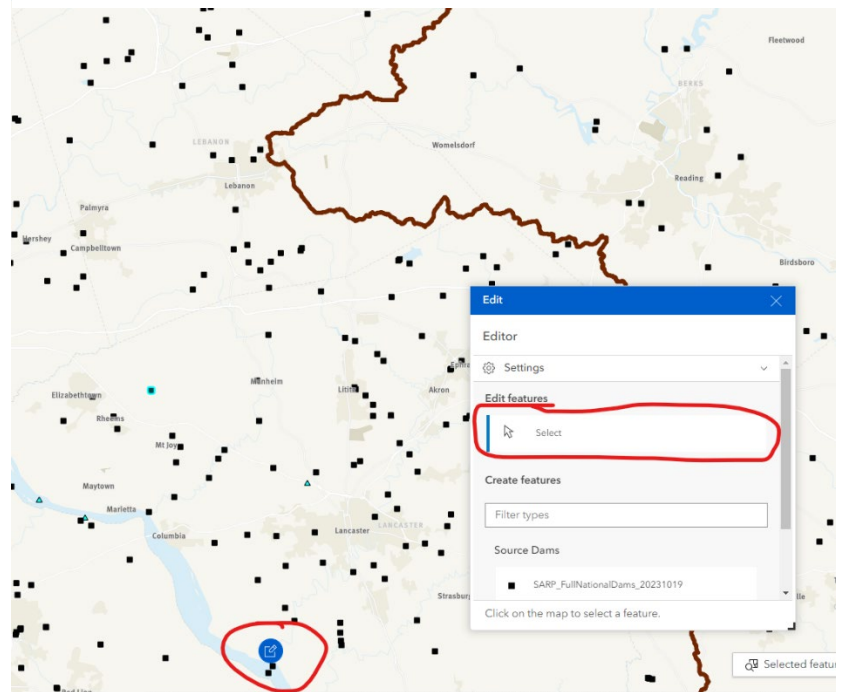
1.2.1 Batch data edits

As part of their work to maintain the national aquatic barrier tool, SARP runs regular updates of the barrier data based on the aggregation of national barrier datasets. These include downloading and merging dams from the National Inventory of Dams (<https://nid.sec.usace.army.mil/#/>), dam removals from American Rivers (<https://www.americanrivers.org/threats-solutions/restoring-damaged-rivers/dam-removal-map/>), and/or the USGS Dam Removal Information Portal (<https://data.usgs.gov/drip-dashboard/>). These updates will be implemented on a yearly basis. Road stream crossing data from the NAACC (https://naacc.org/naacc_search_crossing.cfm) will be updated approximately four times per year. Natural barrier data from the USGS Waterfalls and Rapids in the Conterminous United States (<https://www.usgs.gov/data/waterfalls-and-rapids-conterminous-united-states-linked-national-hydrography-datasets-v20>) will be updated when data are updated in the source data.

1.2.2 Individual Barrier Updates

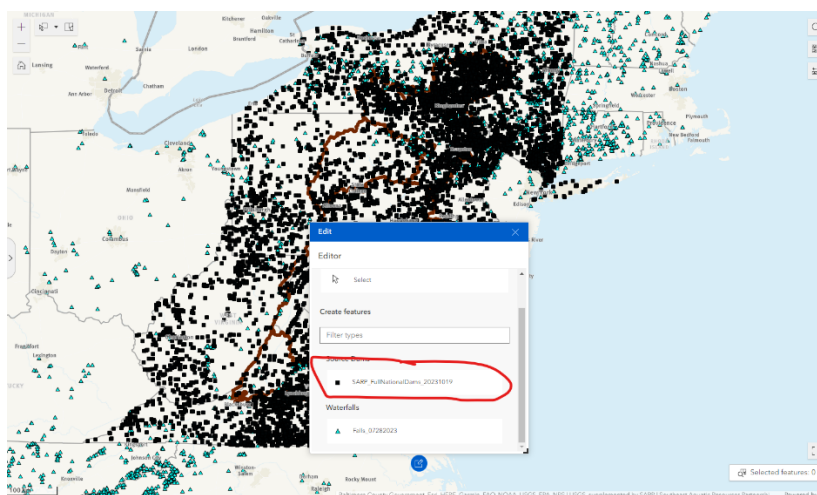
Outside of the batch data updates described above, individual barrier updates can be made by the Chesapeake Fish Passage Community. Existing editors of the Chesapeake data (the core steering committee) have access to the new portal. Other users who identify errors in the barrier data used in the Chesapeake tool can contact the author to obtain credentials to edit the source data (e.g., add a dam, remove a dam) or these edits can be made by the authors or SARP technicians. The data editing portal is available for authorized users at

Figure 1: Data editing portal for making changes to individual dams or natural barriers. The Edit widget is opened by clicking the blue button at the bottom of the image. The editing window is open in this image.



<https://experience.arcgis.com/experience/334477305cc54ba9a2238608c0be8a23>. This portal provides a venue for making edits directly to the SARP-hosted dam and natural barrier data. Edits to road-stream crossing data should be made through the NAACC-framework (<https://streamcontinuity.org/naacc/about/get-involved>).

Figure 2: Adding a new dam point using the Edit widget.



Within the editing portal, the Edit widget can be opened by selecting the blue button at the bottom of the tool. To edit an existing point, choose the “select” tool from the Edit widget then click on a dam. This will bring up a dialog box with attributes which can be edited. Note that points cannot be deleted. If a point is not a barrier, the “Barrier Status” attribute can be updated to “No Barrier.”

To add a point, open the Edit widget and select the layer for which you want to add a point under the “Create Features” heading. In Figure 2, selecting “SARP_FullNationalDams_20231019” will add a new dam point to the layer when the map is clicked.