Washington State Fish Passage Web Application User Guide

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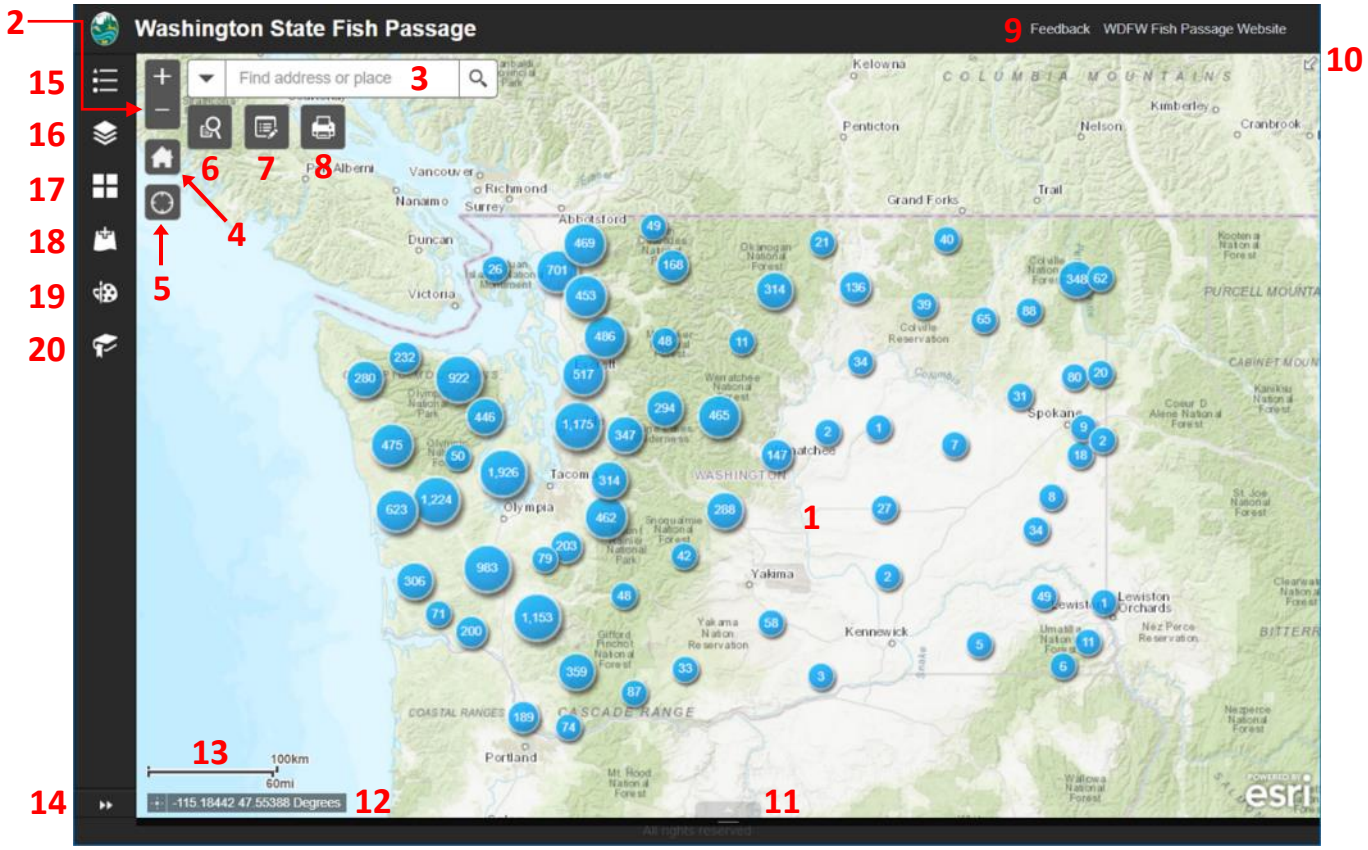
Overview

The purpose of this web application is to provide information about fish passage features inventoried by the Washington Department of Fish and Wildlife (WDFW), other agencies, and partner organizations. Reference layers provide context and information for planning restoration actions. The following image provides an overview of the application's layout:



1. Map Window
2. Zoom In/Out Buttons
3. Search Bar
4. Default Extent Button
5. My Location Button
6. Query Tool
7. Fish Passage Data Editor Tool
8. Print Map Tool
9. App Feedback Survey Link
10. Overview Map Button
11. Attribute Table Open Button
12. Coordinates
13. Scale Bar
14. Expand/Collapse Left Panel Button
15. Legend
16. Layer List
17. Basemap Gallery
18. Add Data Tool
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Map Window Tools

Zoom In/Out

Adjust the map extent by clicking the Zoom In (+) or Zoom Out (-) buttons near the top left corner of the map. Your mouse wheel can also be used to zoom in or out. Double-clicking on the map will zoom in one level. Holding down the "Shift" key and left mouse button, then dragging the mouse to create a rectangle will zoom to that area when the mouse button is released again.

Note that some data layers are only visible at certain zoom levels.

Pan to Area of Interest

Navigate to an area of interest by clicking and holding down your left mouse button, then dragging the map to the desired location. You can also use the Overview Map to pan to a certain location by dragging the grey rectangle to that area.

Search Bar

Zoom to a city, county, address, or landmark by typing it into the Search Bar and pressing the enter key or clicking the magnifying glass icon on the right side of the Search Bar. You can also search for a particular Site ID (the unique identifier for WDFW fish passage sites), WRIA (Water Resource Inventory Area) Number, or longitude and latitude (in XY format; for example, 48.551420 -117.163956). The down arrow on the left side of the Search Bar will limit results to an address, Site ID, or WRIA, if selected. After the search is complete, you can dismiss the results by clicking on the "X" in the Search Bar.

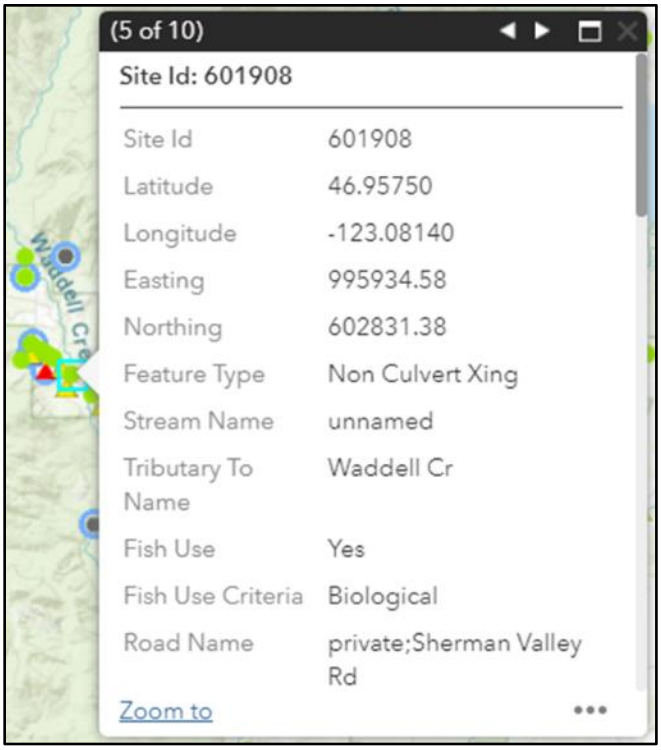
Default Extent Button

Clicking this button will pan and zoom the map to the original extent. Use this to return to the default view of the whole state of Washington.

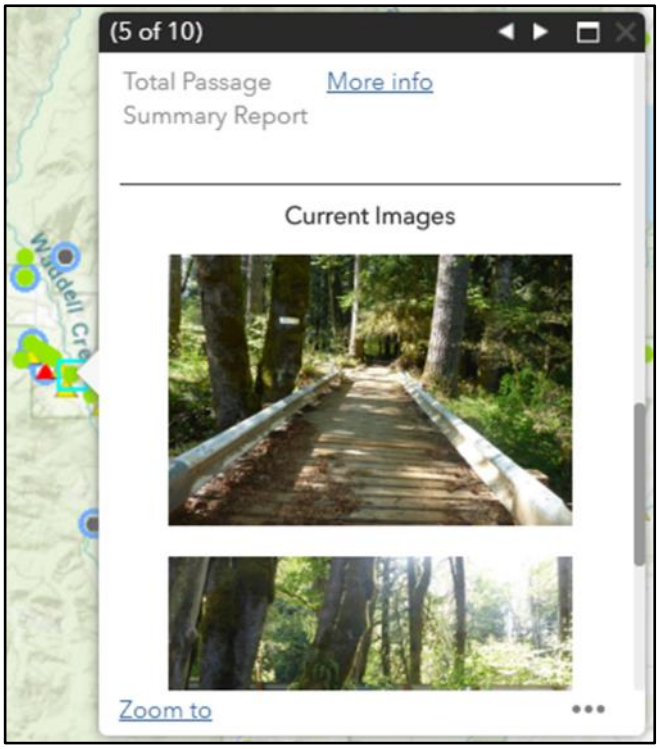
My Location Button

Clicking this button will pan and zoom the map to your location, as determined by your device's GPS or network IP address. This functionality is dependent on device and network settings and may not work on all devices or networks. Clicking the button again will make the app stop using your location.

Identify Features



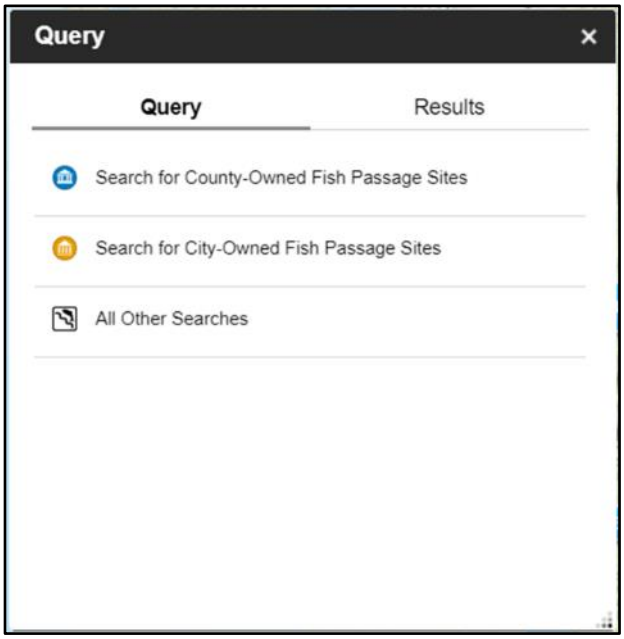
To identify features and view their associated information, click on the feature of interest in the map and a popup dialog box will appear. If there are other features near the one you clicked, you may receive more than one result, indicated by the numbers in the upper left corner of the popup. To navigate to your feature of interest, use the forward and back buttons in the upper right corner. To see the results in a larger window, click the square button in the upper right corner. Use the vertical scroll bar on the right side of the window to view information lower in the popup dialog box. Use the "Zoom to" button in the lower left corner to zoom and center on the selected feature. To close the popup window, click on the grey "X" in the upper right corner.



For additional information about fish passage sites in the WDFW database, scroll down and click the "More info" link to download a full site report. If there are any current or archived photos associated with the site, these will also be displayed at the bottom of the popup. Clicking on one of these photos expands it and allows you to scroll through all of the site photos in a larger window.

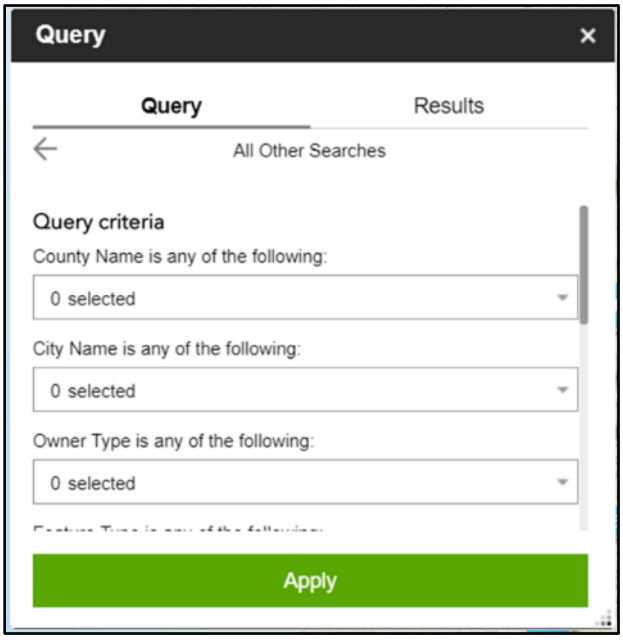
Query Tool

The Query tool allows users to search and extract information from the WDFW fish passage database using a variety of search parameters.



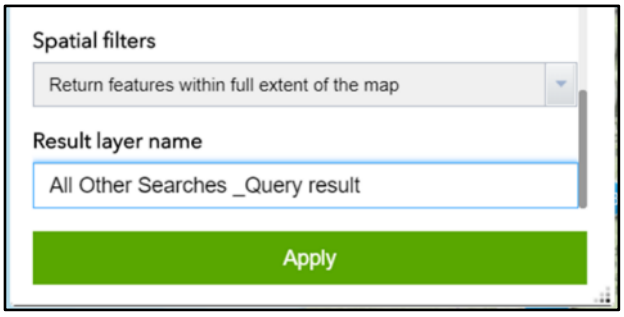
The Query window displays three options: Search for County-Owned Fish Passage Sites, Search for City-Owned Fish Passage Sites, and All Other Searches. Detailed user guides are available for the county searches and city searches. Details on how to use the All Other Searches option follow below.

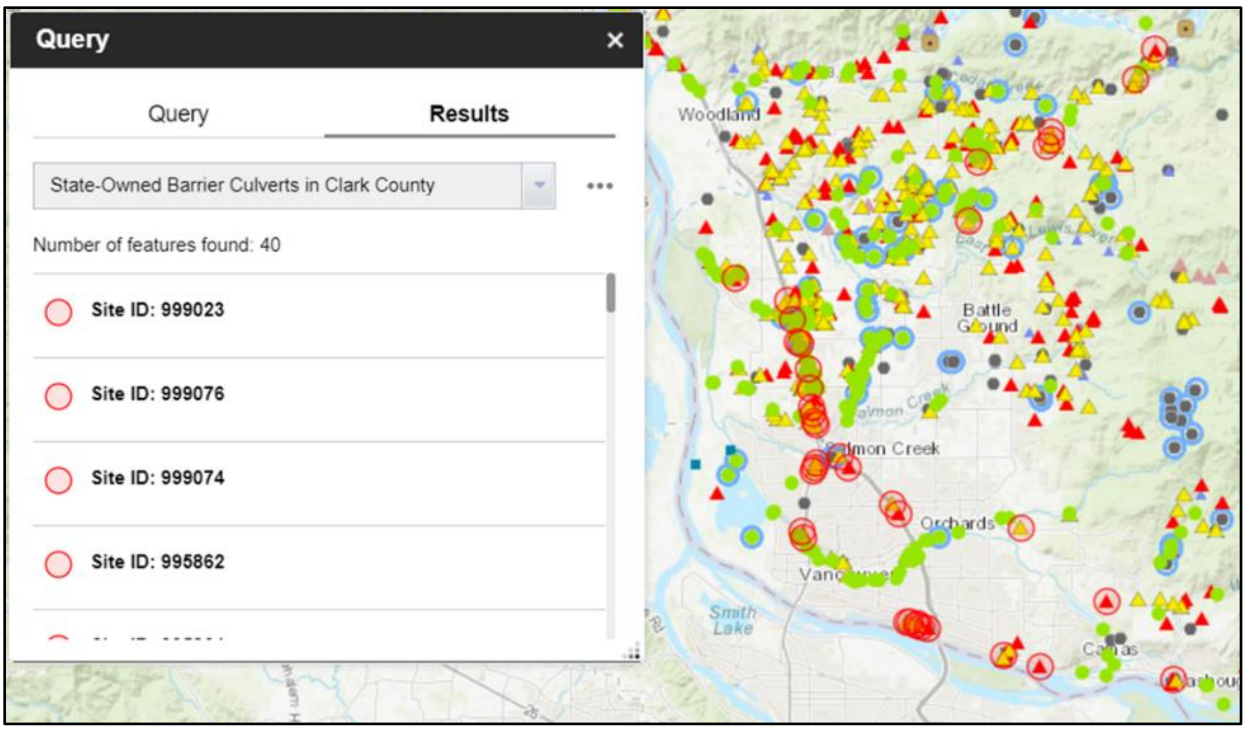
Note that the first two searches return sites owned by the selected counties or cities, not simply within the county or city boundaries.



Clicking on the All Other Searches button displays all of the available criteria for searching the WDFW fish passage database. Use the dropdown arrows next to each parameter box to view the options and make your selections. You can select as many or as few parameters as desired. Use the scroll bar on the right side to view search criteria lower in the window.

At the bottom of the Query window, you have the option to select a spatial extent to search in (the default is the entire state of Washington), as well as rename the new layer that will be created from your query results. Once you are satisfied with all of your search criteria, click Apply.



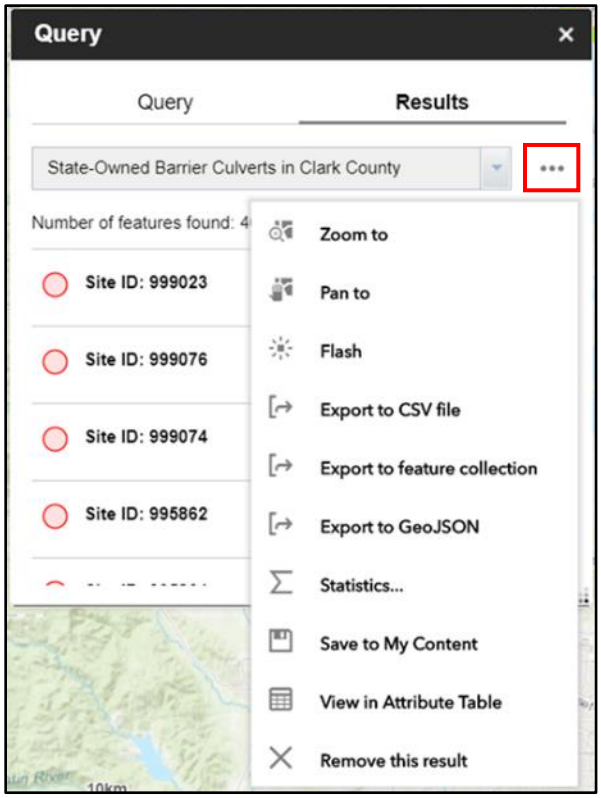


Once your query results load, you will see a list of sites that meet all of your criteria appear in the Query window; the corresponding points will be symbolized on the map by red circles. A count of sites returned by your search ("Number of features found") is displayed near the top of the Query window.

Clicking on the ellipsis button next to your results layer name ("State-Owned Barrier Culverts in Clark County," in this example) reveals a new menu of options for working with your query results. Choosing the "Export to CSV file" option saves the data in a spreadsheet, where you can view the information for all of your sites in a tabular format.

Note that a maximum of 1000 records can be exported at one time.

Also note that any data you download only represent a snapshot in time; the WDFW fish passage database changes frequently as sites are added or reassessed.

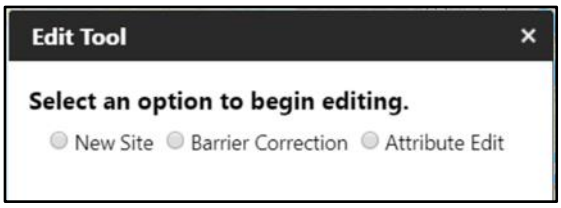


Fish Passage Data Editor Tool

The Fish Passage Data Editor tool enables users to submit fish passage site information to WDFW staff for review. This tool supports three types of submissions:

1. Reporting a new site that is not in the WDFW fish passage database
2. Reporting the correction of a fish passage barrier
3. Editing the attributes of an existing fish passage site

Select one of these three options by clicking on the radio button to its left. This will cause the NHD stream layer to activate automatically, and a new screen prompting you to select the location to be edited will appear in the Edit window.

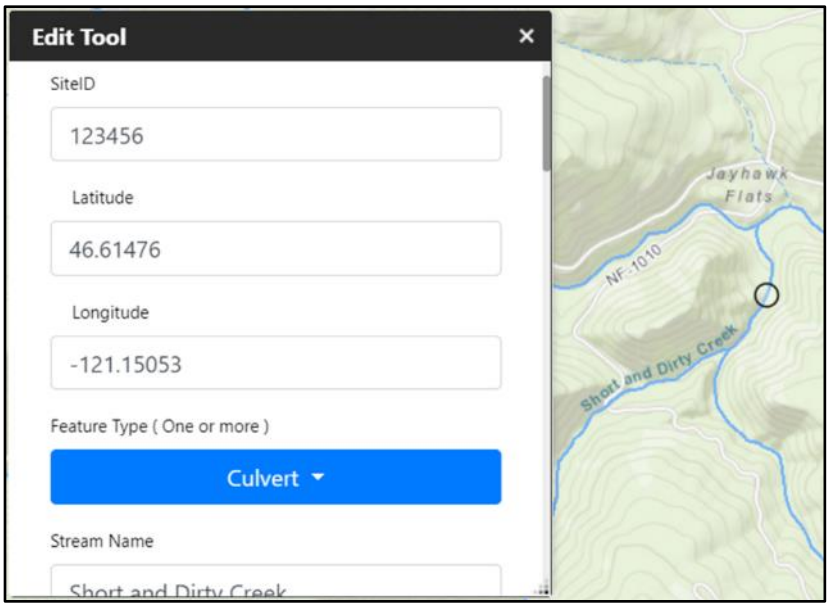


New Site

After you select "New Site," the Edit window will read, "Click on the map where the new site is located" and your mouse cursor will change into a red circle-and-crosshairs icon.

Once you click on the map to indicate where the new site should be located, a black circle will appear at this point and empty fish passage data fields will appear in the Edit window. Scroll through this window and fill in any known information about the site, using dropdown menus where applicable and leaving unknown values blank.

Note that while the "Latitude" and "Longitude" fields populate automatically, these values can be edited.



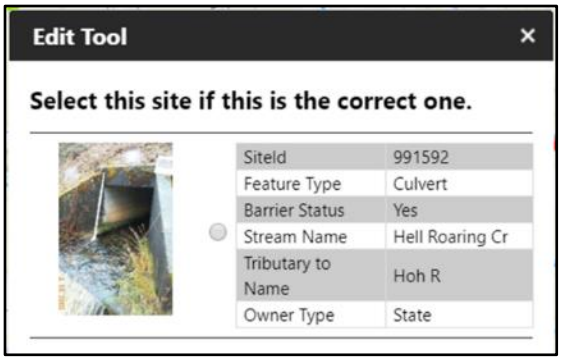
At the bottom of the Edit window, you can add photos or other attachments to your submission by clicking "Choose file" and browsing to the file location.

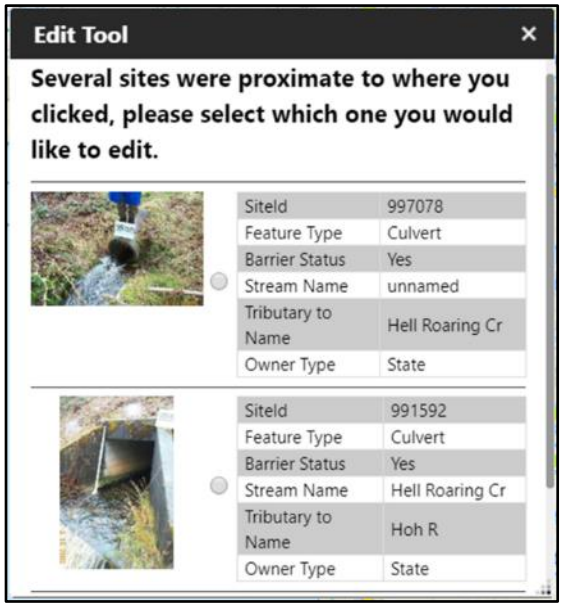
When you have finished providing all known data, click "Submit" to send your site information to WDFW staff. You can click "Cancel" to return to the previous window at any time.

Barrier Correction

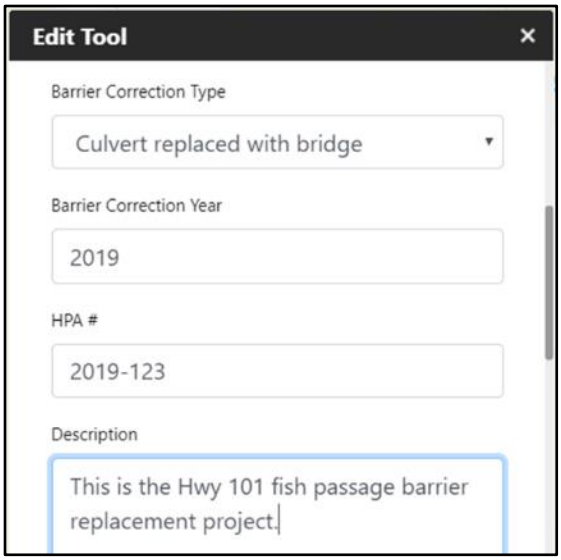
After you select "Barrier Correction," the Edit window will read, "Click on the barrier that has been corrected."

When you select a fish passage barrier from the map, its basic information will appear in the Edit window, along with a preview image (if available). More than one result will appear if there are multiple sites in close proximity. Scroll through the results and use the radio button next to the appropriate site to select it.





If you accidentally select the wrong site, you can click "Back to list of sites" in the next window.



Once you have selected the desired site, empty barrier correction data fields will appear in the Edit window. Scroll through this window and fill in any known information about the site, using dropdown menus where applicable and leaving unknown values blank.

Note that while the "Latitude" and "Longitude" fields populate automatically, these values can be edited. The Site ID, however, cannot be edited.

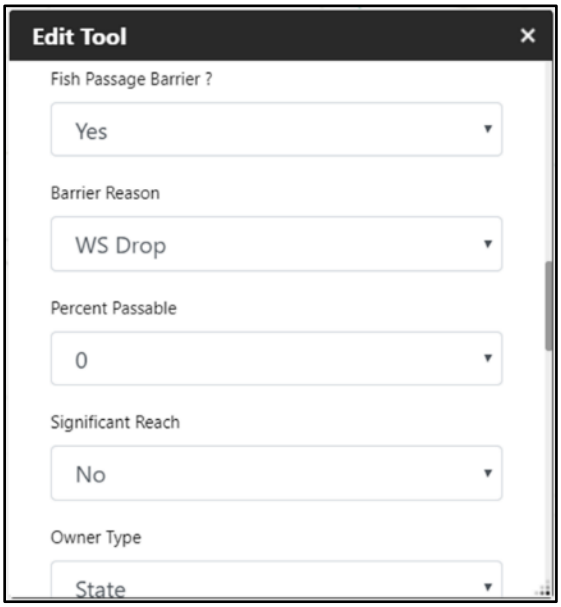
At the bottom of the Edit window, you can add photos or other attachments to your submission by clicking "Choose file" and browsing to the file location.

When you have finished providing all known data, click "Submit" to send your site information to WDFW staff. You can click "Cancel" to return to the previous window at any time.

Attribute Edit

After you select "Attribute Edit," the Edit window will read, "Click on the site you would like to update information for."

Follow the same steps outlined for the "Barrier Correction" option (page 8) to select the desired site.



Once you have selected the site whose information you would like to edit, fish passage data fields will appear in the Edit window. Scroll through this window and update the fields with any known new information about the site, using dropdown menus where applicable and leaving unknown values blank or unchanged.

Note that these fields are automatically populated with the existing site data, all of which can be edited, with the exception of Site ID.

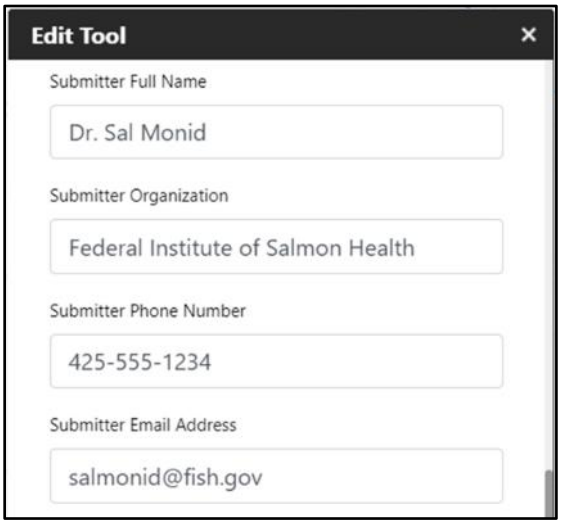
At the bottom of the Edit window, you can add photos or other attachments to your submission by clicking "Choose file" and browsing to the file location.

When you have finished providing all known data, click "Submit" to send your site information to WDFW staff. You can click "Cancel" to return to the previous window at any time.

Submitter Information

Near the bottom of the Edit window for all three submission options, you will see a series of fields where you can provide your contact information. Fish passage site data submitted to WDFW staff may require follow-up; therefore, filling in your name, organization, phone number, and email address before you submit your site information is highly appreciated, though not required.

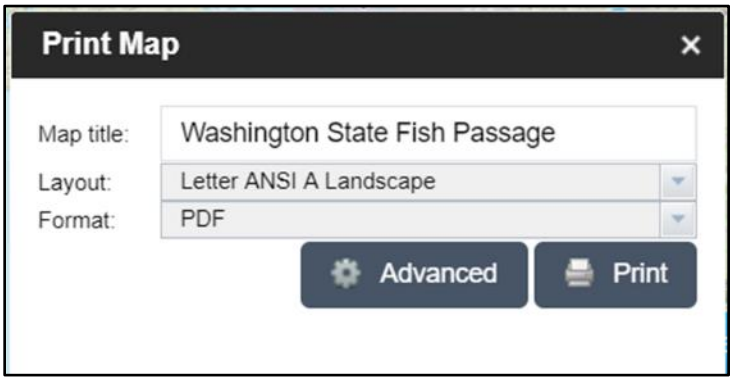
Note that submitted data is not automatically added to the fish passage database; most data corrections are field verified when WDFW crews are available. Also note that any information submitted electronically may be subject to public disclosure.



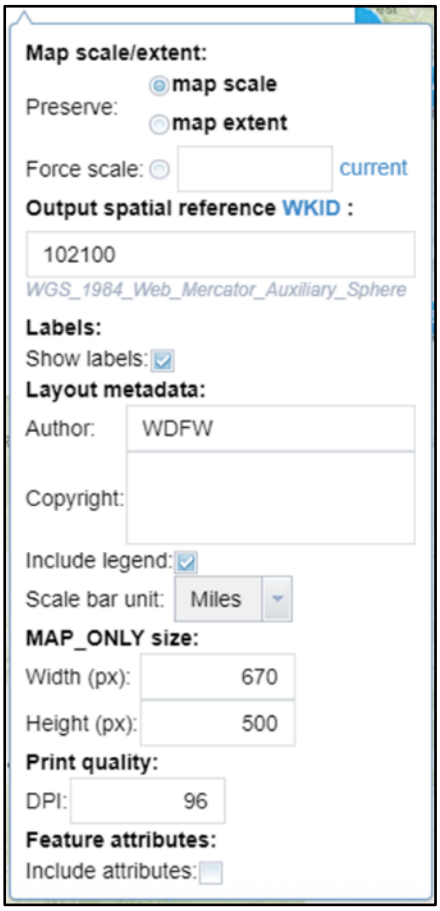
Print Map Tool

The Print Map tool allows users to take any custom map layouts created in the app and export them as PDF or image files that can be saved, printed, and shared.

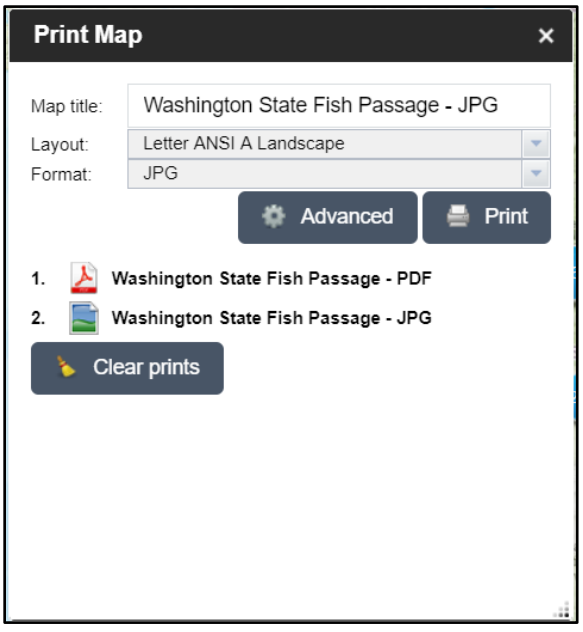
Clicking on the Print Map tool button displays options for changing the title, layout, and output format of your map. Type your desired title in the "Map title" text box and use the drop down arrows in the "Layout" and "Format" fields to customize these options.



Clicking on the Advanced button displays many additional options for customizing the scale, spatial reference, metadata, size, and print quality of your map. When you have finished making changes, click the Print button in the original Print Map dialog box.



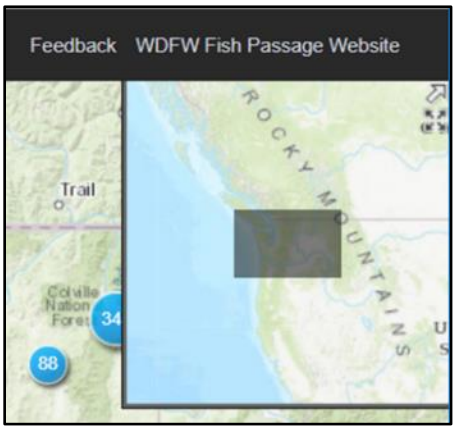
Your map(s) will then appear in the dialog box and, when clicked, will open in a new browser tab. You can then print or save the map file(s) from this tab.



App Feedback Survey Link

If you experience any issues using the app, notice errors in the fish passage data, or have ideas for improvement, clicking on the "Feedback" link in the top right corner of the app will take you to a short survey where you can document your comments. You also have the option to include your contact information if you would like WDFW fish passage staff to follow up with you regarding your feedback.

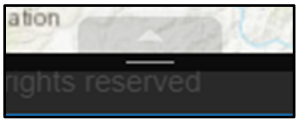
Overview Map



The Overview Map can be accessed by clicking the small white arrow in the upper right corner of the app. It displays the current location and extent of the main map window (shown as a grey rectangle) in the context of the larger surrounding area. Click and drag the grey rectangle to pan the main map window to a new area. To close the Overview Map, click the white arrow again. For a full screen view of the Overview Map, click the button below the white arrow (shown as four dark grey arrows). Click this button again to close the full screen view.

Attribute Table

The Attribute Table allows users to view data from the app in a tabular format, as well as select records, filter by spatial extent, filter by criteria, and export the data as a comma separated value (.csv) file.

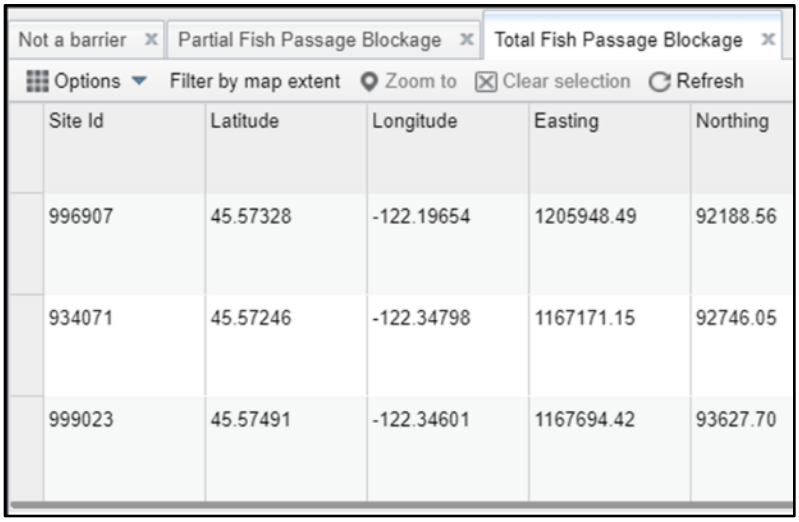


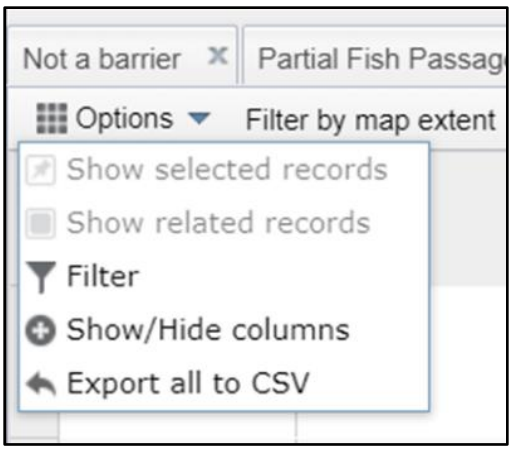
The Attribute Table can be opened by clicking on the semi-transparent up arrow located in the center at the bottom of the map window (it may be difficult to see, depending on which basemap is currently being used).

Note that until you select a layer whose attributes you want to display, the Attribute Table window will appear empty. Tabular data for any layer in the app can be accessed and opened via the Layer List; see Left Panel Tools > Layer List (page 15) for more details.

You can adjust the Attribute Table window height by clicking anywhere along the dark grey bar at the top of the window and dragging it up or down. If you have data tables for multiple layers open, you can navigate between them by clicking on the labeled tabs near the top of the window.

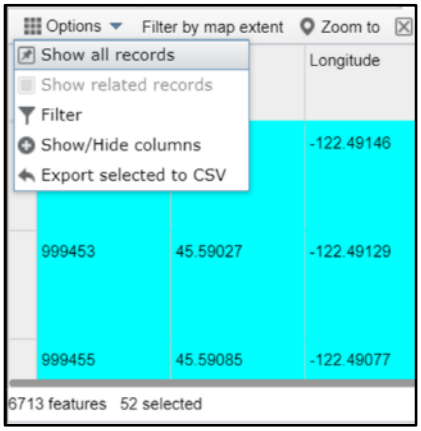
Below these tabs, you will see a "Filter by map extent" button that limits the data shown in the Attribute Table to only the features that are currently being displayed in the map window. You can remove this spatial filter by clicking the button again. Select specific records (rows) by clicking the empty box to the left of the Site Id column; your highlighted row(s) will appear in bright blue. Click "Zoom to" to pan and zoom the map to your selection, and click "Clear selection" to remove any selections you have made. Click "Refresh" if you need to reload any of the data.

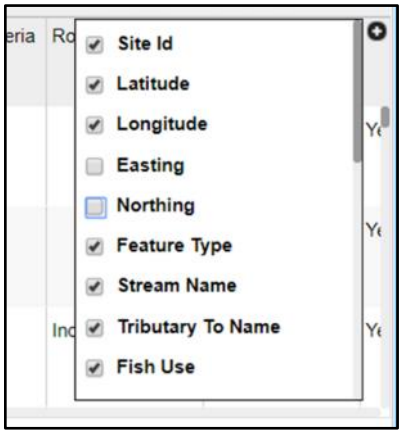




Clicking on the Options button, located in the upper left corner of the Attribute Table window, opens a menu of additional options for displaying and working with the data.

If you have already selected one or more records in the Attribute Table, clicking the "Show selected records" button in the Options menu removes all unselected records from the Attribute Table window. You can still see the total number of features in the layer in the bottom left corner of the window. To return to the full list of records, click on the same button – which should now read, "Show all records."





If you would like to change which attributes are displayed in the Attribute Table window, click on the "Show/Hide columns" button in the Options menu. A dialog box, where you can select and unselect columns using the check boxes next to their names, will appear on the right side of the window. You can also access this dialog box by clicking on the black circle with a white plus sign near the top right corner of the Attribute Table window. Clicking anywhere outside of the "Show/Hide columns" dialog box will close it.

Exporting tabular data to an external spreadsheet can be useful for manipulating and working with these data offline. After clicking the "Export all to CSV" button (or "Export selected to CSV," if you have certain records selected), click "OK" to download the file. It will download to your browser's default download folder. To stop the download process, select "Cancel." *Note that 1) a maximum of 1000 records can be exported at one time, and 2) any data you download only represent a snapshot in time; the WDFW fish passage database changes frequently as sites are added or reassessed.*

Finally, the "Filter" option allows users to add query expressions or expression sets that filter the data from a selected layer using specified values. Click the "Filter" button in the Options menu, then choose "Add expression" or "Add set." An expression set must contain two or more expressions, though multiple expressions can also be added under the "Add expression" option. For each expression, a field name, an operator, and a value must be provided. If more than one expression is defined, use the dropdown menu at the top of the window to indicate whether all or any of the filter criteria must be true (this corresponds to the "And" and "Or" operator logic behind the filter).

Use the first expression dropdown menu to select the field you would like to filter by. The next dropdown menu lists all available operator options for filtering the data, such as "is any of" or "does not contain." Enter the desired filter value in the last box; click on the cog button to the right of the box to set the input type. Keeping the default value of "Value" allows you to type your criteria into the box, while selecting "Unique" displays all available value options for the selected field in a dropdown list.

Coordinates Tool

The Coordinates Tool displays the x and y values of the mouse pointer in the lower left corner of the main map window. The default coordinate system is WGS 1984 Web Mercator Auxiliary Sphere (decimal degrees). This tool can also be used to capture coordinates for a particular point by clicking on the reticle button to the left of the displayed coordinates, then clicking on the desired location on the map. The coordinates of the point clicked will be locked into the coordinate display and can then be copied to the clipboard by highlighting the coordinates, right clicking, and selecting "Copy" from the dialog box (or pressing CTRL + C). Clicking the button on the left again will unlock the coordinates and allow you to repeat the process.

Scale Bar

The scale bar is located in the lower left corner of the main map window and displays a reference scale based on the current extent. Units are displayed in measurements of miles/kilometers or feet/meters, depending on the scale.

Left Panel Tools

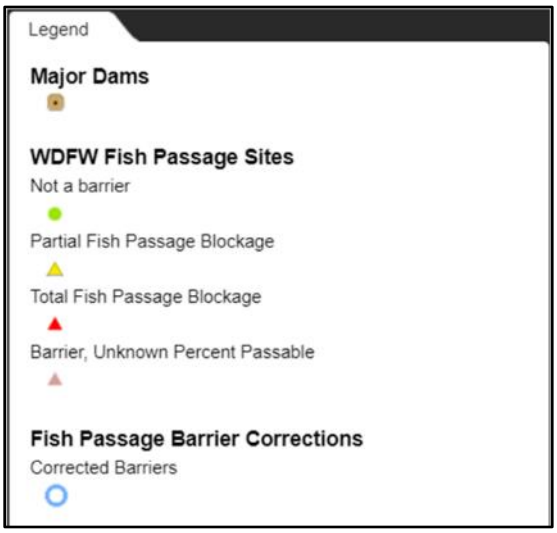
Expanding/Collapsing the Left Panel

The panel on the left side of the app contains additional tools. To expand it, click on the double arrow icon in the bottom right corner; to collapse it, click on this button again. Clicking on any tool while the panel is collapsed also opens it.

When the panel is collapsed, the tool buttons are aligned vertically; when expanded, they are displayed horizontally across the top of the panel (as above).

Legend

The Legend shows the corresponding symbols for features in the layers that are currently displayed on the map. Open the Legend by clicking the first button on the left tool panel.

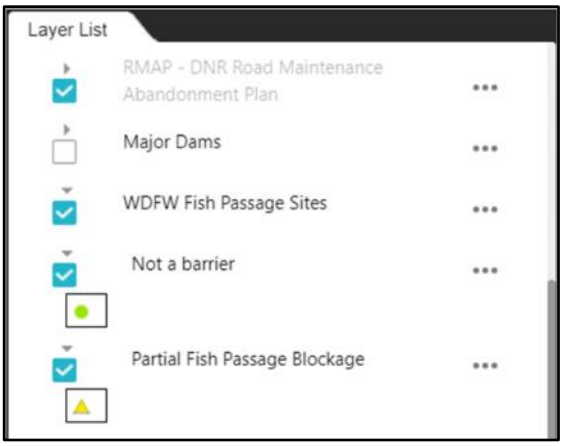


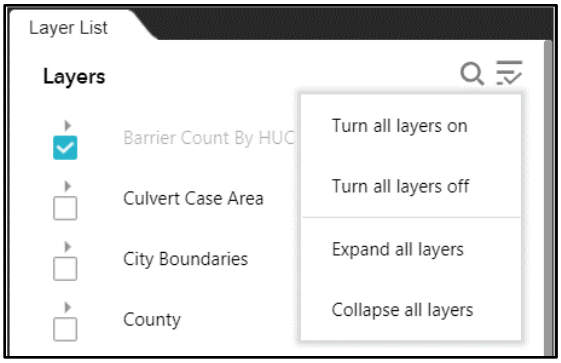
Layer List

The Layer List shows all available operational layers in the app and allows the user to control layer visibility by clicking the checkboxes to the left of the layer names.

Note that some of the layers in this app are not displayed at all scales.

If the checkbox is checked and the layer name appears light grey, the layer will not be displayed at the current map extent. Zooming in or out accordingly will make these layers visible. Layer symbology can be viewed by clicking on the small grey arrow above the layer visibility checkbox. In some cases, layers are grouped together; clicking the arrow will expand the group and show its sublayers. Each sublayer also has a visibility checkbox and an arrow that expands the selection.

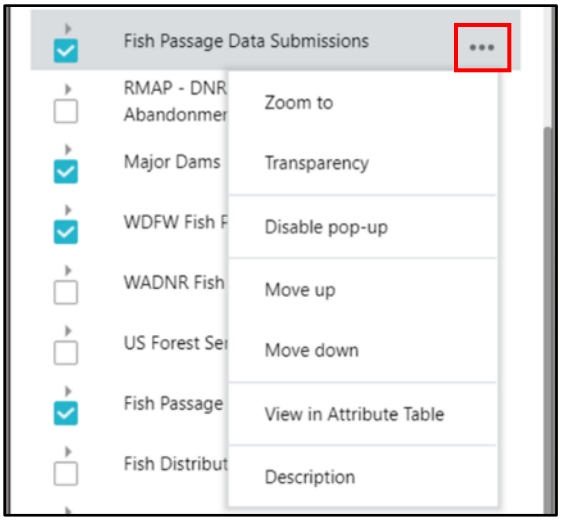




If you scroll to the top of the Layer List window, you will see two additional buttons. Clicking the magnifying glass icon allows you to search for layer names by keyword. Clicking the button to the right expands a new menu where you can display/hide or expand/collapse all of the layers at once.

Each layer in the Layer List has an ellipsis icon to the right of its name; clicking this button opens a menu of additional options for layer display.

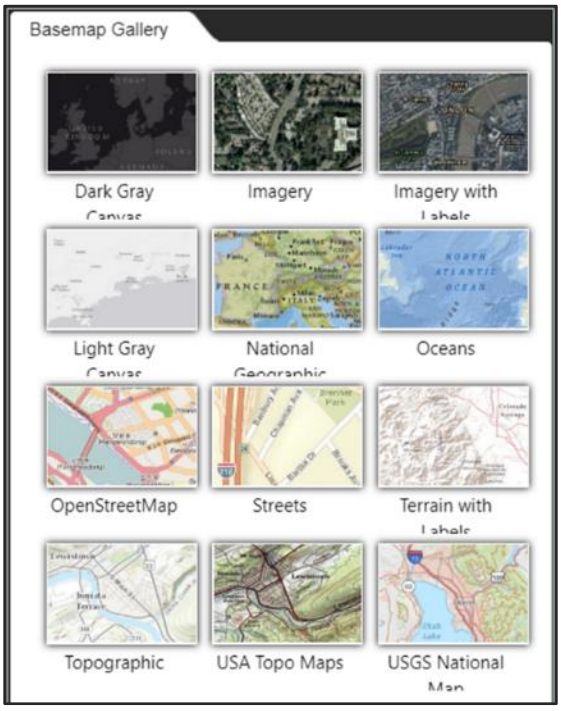
These options perform the following functions:



- "Zoom to" pans, zooms, and centers the map at the extent of the selected layer.
- "Transparency" opens a new dialog box with a slider to adjust how opaque or transparent the layer appears.
- "Disable pop-up" will prevent popup dialog boxes from appearing when features in the layer are clicked. This button will change to "Enable pop-up" after being disabled.
- "Move up" and "Move down" allow you to change the order in which layers appear in the Layer List and the map.
- "View in Attribute Table" opens the Attribute Table window (described in Map Window Tools > Attribute Table [page 11]), and displays the tabular data for the selected layer.
- "Description" opens the metadata page for the layer in a new browser tab.

Basemap Gallery

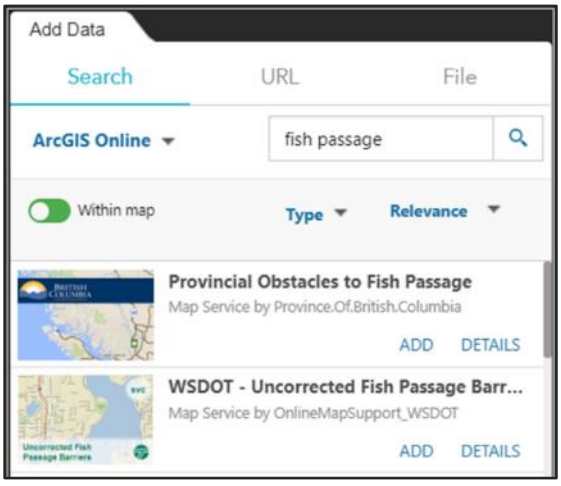
The Basemap Gallery allows users to change the underlying map displayed beneath all visible layers in the map window, which can help improve feature visibility and provide appropriate context for the features shown.



Change the basemap by selecting one of the twelve options shown. The default basemap is "Topographic." If any of the basemap labels appear cut off, hovering your mouse pointer over each one will display its name.

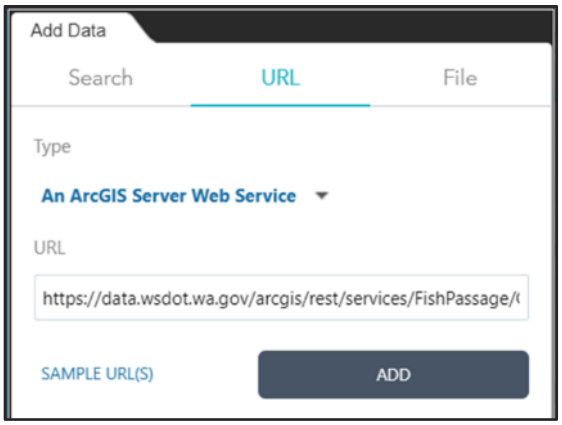
Add Data Tool

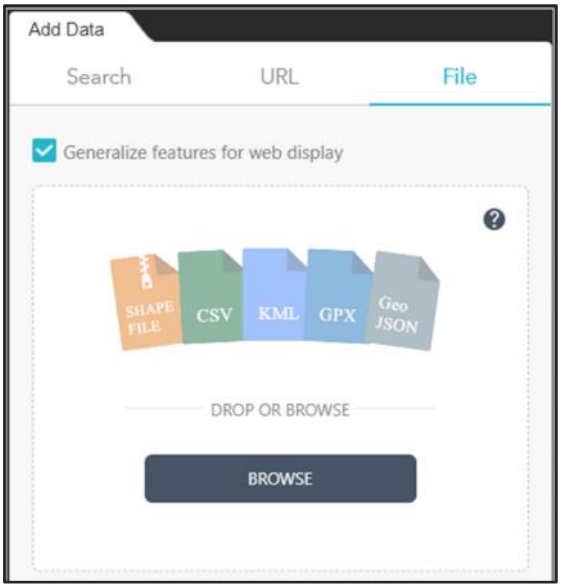
The Add Data tool allows users to display additional layers beyond what is offered in the Layer List. There are three options for selecting data to add: Search, URL, and File, which are listed across the top of the Add Data window.



The first option, Search, gives you access to all publicly available content in ArcGIS Online. To narrow your search, type keywords into the search box, use the green "Within map" toggle button to limit the search to the current map extent, and use the "Type" dropdown list to limit the types of results returned. Sort your results using the "Relevance" dropdown list. Once you have found the layer(s) you would like to add, click the "ADD" button below each one. To view available metadata for the layer, click "DETAILS."

The second option, URL, allows you to add data to the map using web services or files. Use the dropdown menu under “Type” to select your URL format, then copy and paste the desired web address in the “URL” text box. Click “SAMPLE URL(S)” to see examples of each format type. When you have finished, click the “ADD” button.





The third option, File, allows you to add data in a variety of file formats. Click “BROWSE” to search through your file directory and select the desired file. When you click “Open” in the browse dialog box, your file will be automatically added to the map. Alternately, you can drag a file from your file explorer and drop it over the multicolored file type icons in the Add Data window.

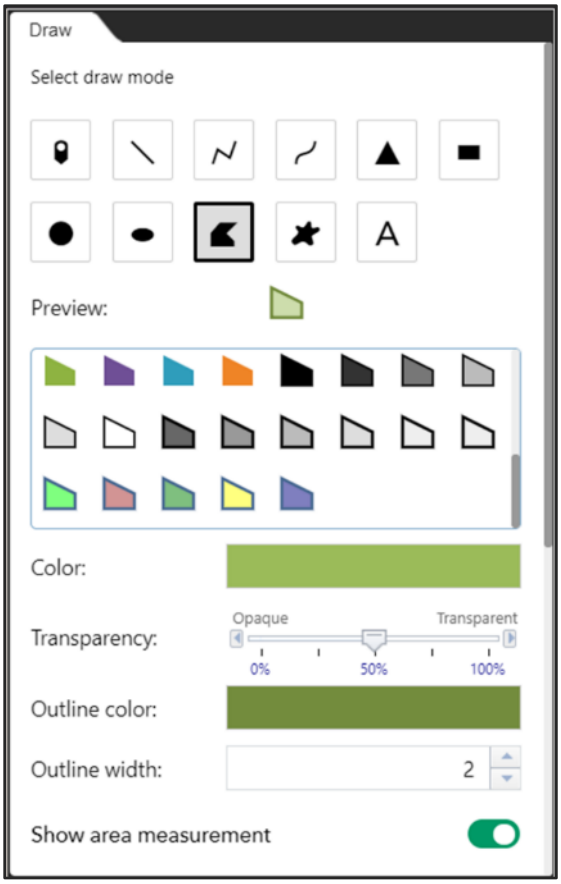
Once you have successfully added your layer you will see the file name displayed, along with the number of features the file contains, in the lower left corner of the Add Data window. *Note that files with more than 1000 features will not load.*

After you have used one of these methods to add layers to the map, click the “LAYERS” button at the bottom of the Add Data window to see a list of them.

From here, you can remove any added layers from the map by clicking on the garbage can icon next to its name. Any layers you have added will also appear in the Layer List (for information on how to access and use the Layer List, see Left Panel Tools > Layer List [page 15]).

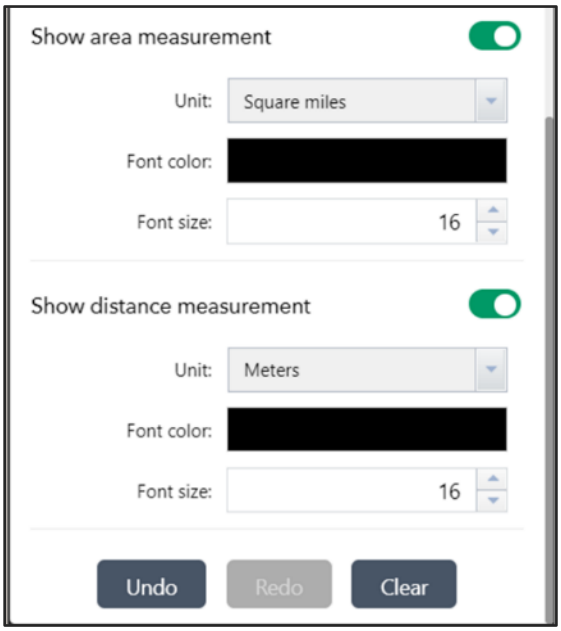
Draw Tool

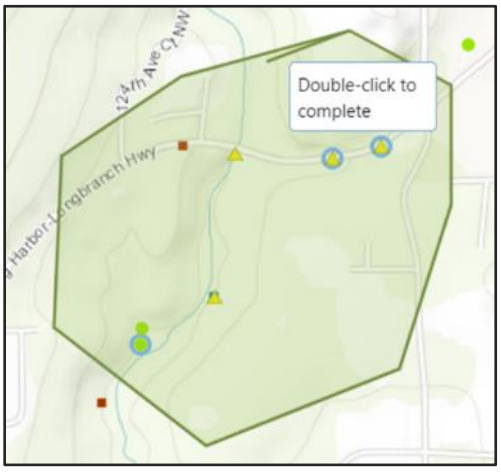
The Draw tool allows users to mark up the map with points, lines, polygons, and text. This tool can be used in conjunction with the Print Map tool to create and share custom map layouts.



Once you select a draw mode by clicking on one of the icons at the top of the Draw window, a preview of the selection appears, along with a new menu of customization options. Use one of the shape templates in the gallery below "Preview" or create your own by adjusting the style options. *Note that the options displayed will vary depending on whether you selected a point, line, polygon, or text draw mode.*

Scroll down to the bottom of the Draw window and use the green toggle button(s) to see options for displaying measurements on the map (when applicable).





After you have finished selecting the desired options, click on the map to begin drawing. Tool tips with short instructions on how to complete the drawing will appear next to your mouse cursor as you draw.

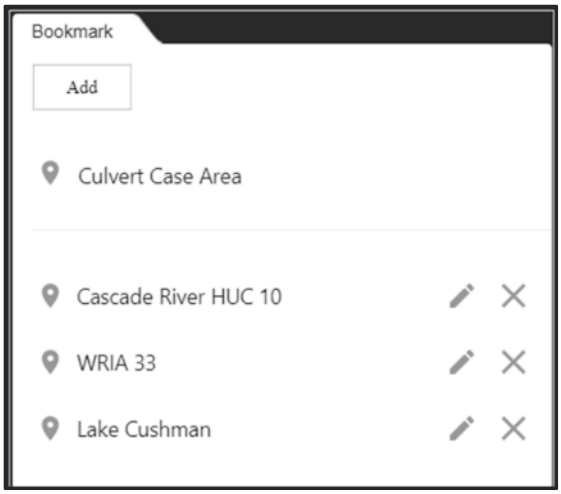
Click on the draw mode icon again to disable the Draw tool and allow for panning around the map again. Use the "Undo," "Redo," and "Clear" buttons at the bottom of the Draw window to adjust or remove the shapes you have added to the map window.

Bookmark Tool

The Bookmark tool allows users to create bookmarks for custom spatial extents in the map and then return to these extents at a later time.

Once you have zoomed to the desired map extent, clicking the "Add" button at the top of the Bookmark window will cause a new line to appear in the bookmarks list. Click on the pencil icon and type in a custom name for your bookmark, then click anywhere on the bookmark name to zoom back to the bookmarked map extent. To delete any bookmark, click on the corresponding "X" next to it.

Note that you cannot edit or delete the "Culvert Case Area" bookmark because it is a default app bookmark.



Note that cookies must be enabled in your browser in order for the Bookmark tool to work properly.

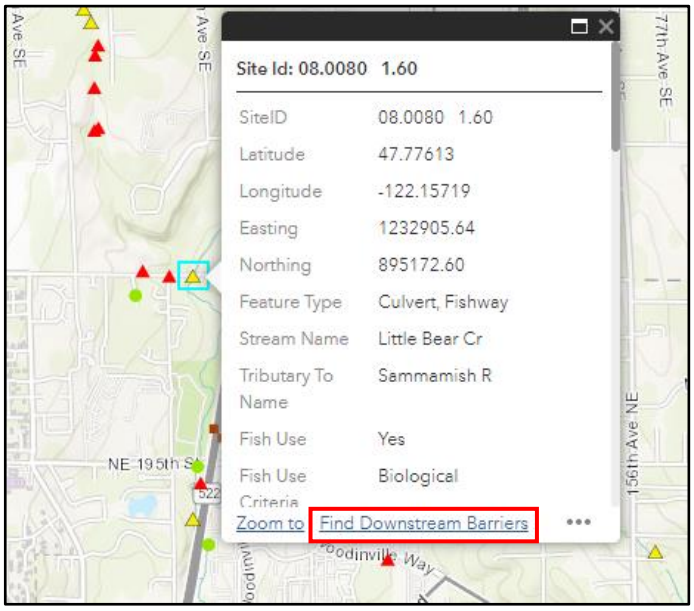
If you have further questions about the WDFW Fish Passage Web Application, please contact Rachel Bouchillon at rachel.bouchillon@dfw.wa.gov.

Appendix A: Find Downstream Barriers Tool

In 2022, an additional custom tool was developed for the Washington State Fish Passage Web App. It allows users to identify any barriers downstream of a given fish passage site. This tool is accessed via the WDFW Fish Passage Sites pop-up windows. **It was created through a National Estuary Program-funded pilot project and should be treated as a beta version; there are known issues with the tool.**

Selecting any valid WDFW Fish Passage Site will reveal a new button at the bottom of the pop-up window, labeled "Find Downstream Barriers." Click on this button to run the tool; it may take several seconds to return results.

Note that due to underlying inaccuracies in the National Hydrography Dataset, the tool may occasionally return barriers that are upstream of the selected site or may miss some downstream barriers. Additionally, you may see a new pop-up window warning you that the site you selected is too far away from the NHD stream line.



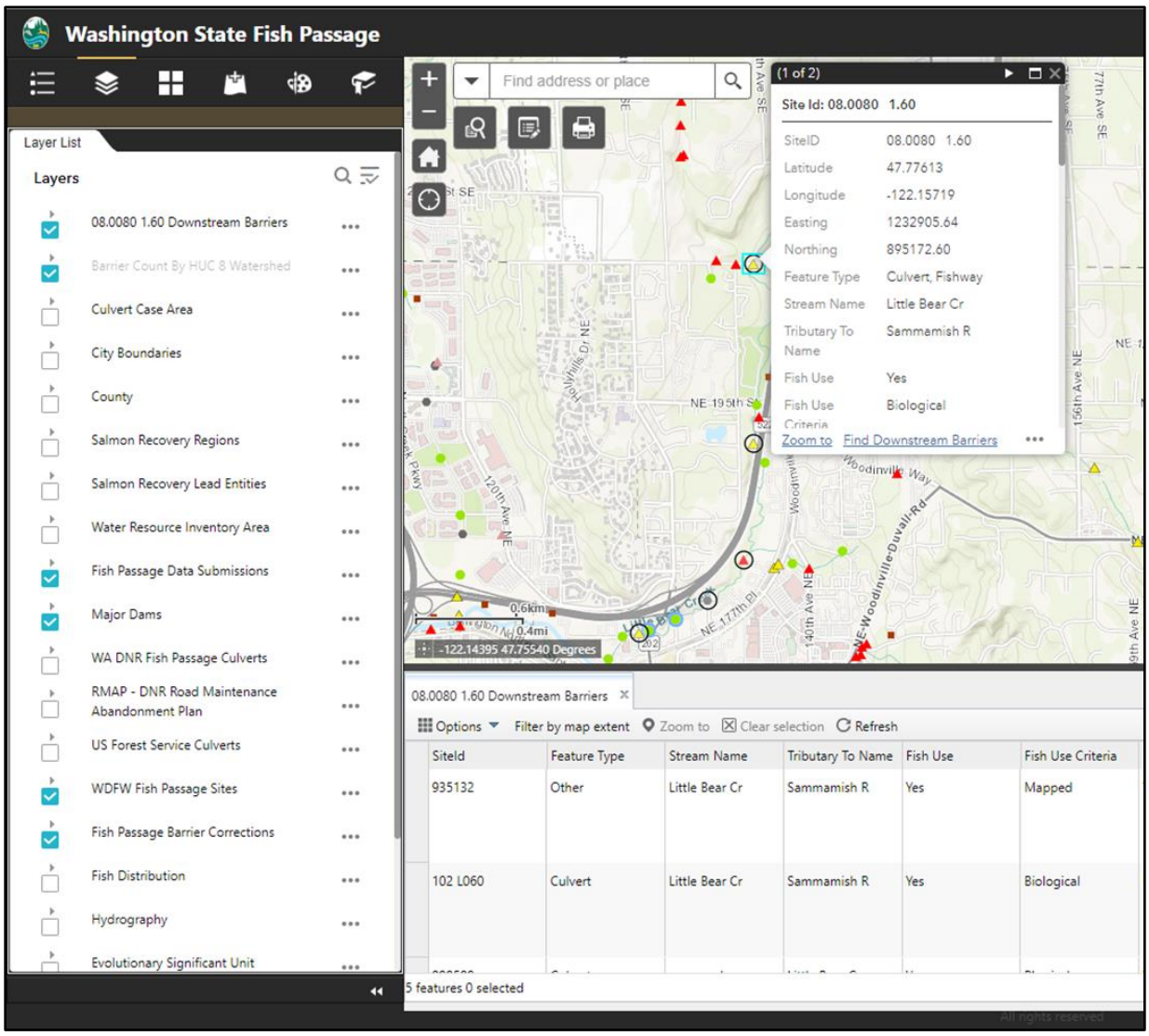
Once the tool runs, a new layer will appear at the top of the layer list and will be named "[Site ID] Downstream Barriers." Its attribute table will open automatically at the bottom of the web app and any identified downstream barriers will be marked with a black circle on the map (see screenshot on page 22).

From here, you can interact with the attribute table using the instructions that start on page 11, which include how to export the data to a CSV file. You can also perform multiple downstream analyses in a single browser session, turn downstream barrier results layers off and on via the layer list, and open and close each of the downstream barriers attribute tables as desired. To remove all existing results and start over, simply refresh the web page.

For support validating the list of downstream barriers, please reach out to WDFW's Fish Passage Inventory & Assessment Section; contact information is available here.

NOTE: This tool only works on the "WDFW Fish Passage Sites" layers, and not on any of the other fish passage layers that appear in the web app (such as "US Forest Service Culverts").

*NOTE: Currently, this tool will only identify downstream barriers for fish passage sites **in the Puget Sound region (WRIAs 1-19)**. If you do not see an option to Find Downstream Barriers in the pop-up window, make sure that the site you have selected is within WRIAs 1-19.*


Washington State Fish Passage
Layer List
Layers
08.0080 1.60 Downstream Barriers
Barrier Count By HUC 8 Watershed
Culvert Case Area
City Boundaries
County
Salmon Recovery Regions
Salmon Recovery Lead Entities
Water Resource Inventory Area
Fish Passage Data Submissions
Major Dams
WA DNR Fish Passage Culverts
RMAP - DNR Road Maintenance Abandonment Plan
US Forest Service Culverts
WDFW Fish Passage Sites
Fish Passage Barrier Corrections
Fish Distribution
Hydrography
Evolutionary Significant Unit
Find address or place
(1 of 2)
Site Id: 08.0080 1.60
SiteID 08.0080 1.60
Latitude 47.77613
Longitude -122.15719
Easting 1232905.64
Northing 895172.60
Feature Type Culvert, Fishway
Stream Name Little Bear Cr
Tributary To Name Sammamish R
Fish Use Yes
Fish Use Criteria Biological
Zoom to
Find Downstream Barriers
-122.14395 47.75540 Degrees
08.0080 1.60 Downstream Barriers
Options
Filter by map extent
Zoom to
Clear selection
Refresh
SiteId
Feature Type
Stream Name
Tributary To Name
Fish Use
Fish Use Criteria
935132
Other
Little Bear Cr
Sammamish R
Yes
Mapped
102 L060
Culvert
Little Bear Cr
Sammamish R
Yes
Biological
5 features 0 selected