

# WDFW Fish Passage Data

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# Overview

- A brief history
- Schema
- Interacting with FPDSI data
- Future state and enhancements



# History

Fish Passage and Diversion Screening Inventory (FPDSI) has origins from a variety of other sources

- SSHEARBase (Salmonid Screening Habitat Enhancement and Restoration = SSHEAR) 1998
- Jefferson County Barrier Culvert Inventory (1997)
- Thurston County Barrier Culvert Inventory (1996)
- WSDOT Barrier Culvert Inventory (1992)
- Fishway Inspection (1986)
- Unresolved Fish Passage Problem (1986)





# Schema

Tables (more or less)

- Site
  - Fish Passage Status
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
  - Fishway
  - Diversion
  - Owner
  - Habitat
  - Species
  - Repair



# Schema

Tables (more or less)

- **Site**
  - Fish Passage Status
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
    - Fishway
  - Diversion
  - Owner
  - Habitat
  - Species
  - Repair
- Highest level table
- Location, location, location
  - Coordinates
  - Stream name (and tributary to name)
  - County
  - Water Resource Inventory Area
  - Road
- Fish use



# Schema

## Tables (more or less)

- Site
  - **Fish Passage Status**
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
    - Fishway
  - Diversion
  - Owner
  - Habitat
  - Species
  - Repair
- Between Site and fish passage feature tables
- Data source
- Barrier status
- Barrier reason
- Percent passable
- Field review date



# Schema

## Tables (more or less)

- Site
  - Fish Passage Status
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
  - Fishway
  - Diversion
  - Owner
  - Habitat
  - Species
  - Repair
- Fish passage features tables
  - Attributes specific to the type of feature
  - For any one site, there can be only one of these types
    - But culvert can have many culverts
  - Culvert = culverts, Dam = dams
  - Non-culvert crossings: bridges, fords, puncheons, abandoned crossings
  - Natural barriers: waterfalls, cascades, subsurface flow
  - Other: flumes, roughened channels, levees, tide/flood gates, and so much more





# Schema

## Tables (more or less)

- Site
  - Fish Passage Status
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
    - **Fishway**
  - Diversion
  - Owner
  - Habitat
  - Species
  - Repair
- Fishway makes a fish passage feature passable
- Business rules require on of the five fish passage features to be present in order to create a fishway in database



# Schema

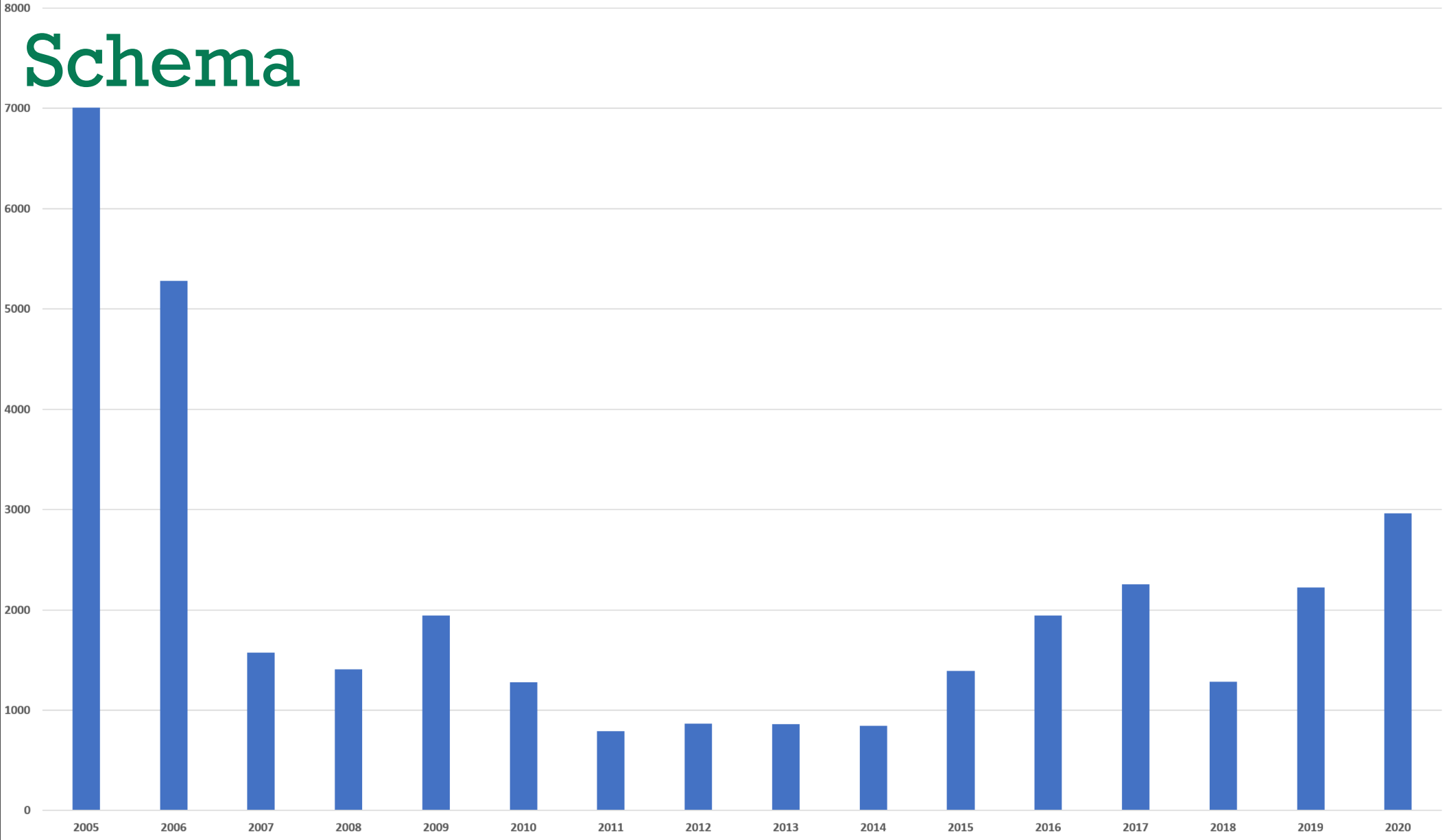
## Tables (more or less)

- Site
  - Fish Passage Status
    - Culvert
    - Non-culvert Crossing
    - Dam
    - Natural Barrier
    - Other
  - Fishway
  - **Diversion**
  - **Owner**
  - **Habitat**
  - **Species**
  - **Repair**
- Other higher level tables
  - Most have 1:1 relationship with Site, diversion and species are exceptions
  - Repair has 1:1 relationship with site, but that doesn't mean a site can't be repaired more than once



FPDSI New Sites by Year

# Schema



# Interacting with FPDSI data

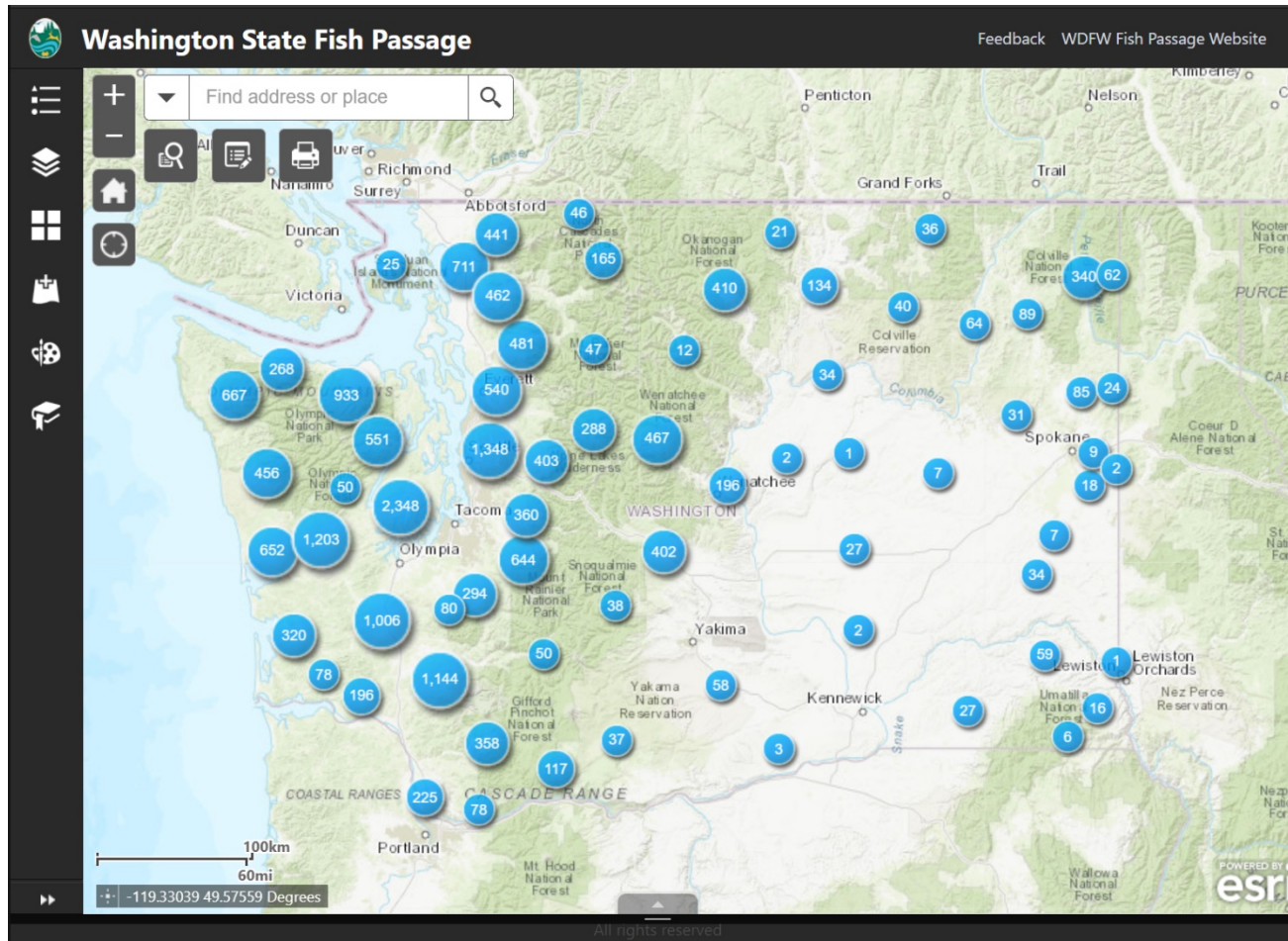
- WDFW staff use an Access front end

- Coming soon, mobile data collection!



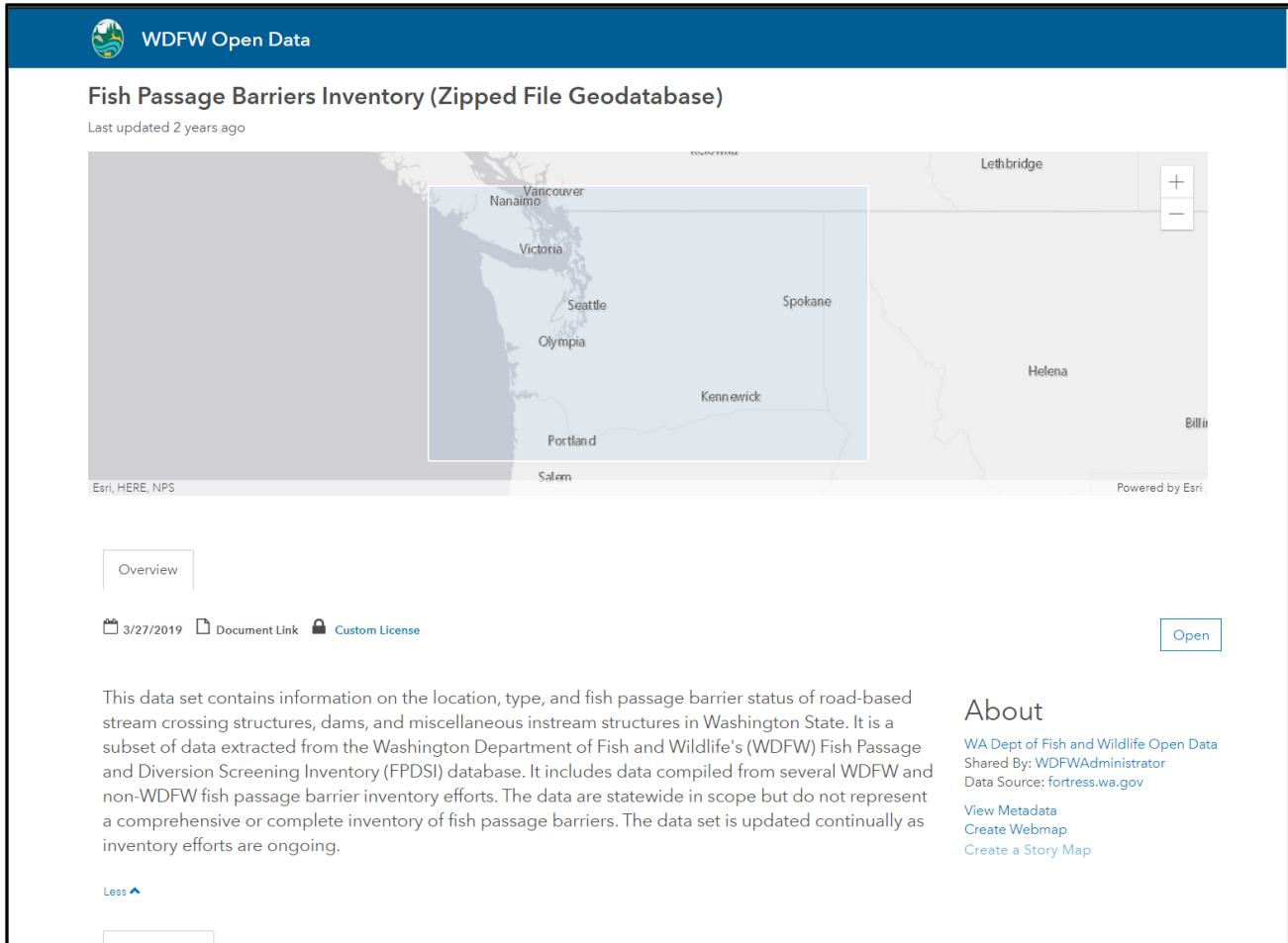
# Interacting with FPDSI data

<https://geodataservices.wdfw.wa.gov/hp/fishpassage/index.html>



# Interacting with FPDSI data

<https://data-wdfw.opendata.arcgis.com/datasets/fish-passage-barriers-inventory-zipped-file-geodatabase>



The screenshot shows the ArcGIS Open Data interface for the 'Fish Passage Barriers Inventory (Zipped File Geodatabase)'. The page header includes the WDFW logo and 'WDFW Open Data'. The title is 'Fish Passage Barriers Inventory (Zipped File Geodatabase)' with a sub-header 'Last updated 2 years ago'. A map of Washington State is displayed, showing major cities like Vancouver, Nanaimo, Victoria, Seattle, Olympia, Portland, Salem, Spokane, Kennewick, Lethbridge, Helena, and Billings. The map is powered by Esri. Below the map, there is an 'Overview' tab, a date '3/27/2019', a 'Document Link' icon, a 'Custom License' icon, and an 'Open' button. The main text describes the data set: 'This data set contains information on the location, type, and fish passage barrier status of road-based stream crossing structures, dams, and miscellaneous instream structures in Washington State. It is a subset of data extracted from the Washington Department of Fish and Wildlife's (WDFW) Fish Passage and Diversion Screening Inventory (FPDSI) database. It includes data compiled from several WDFW and non-WDFW fish passage barrier inventory efforts. The data are statewide in scope but do not represent a comprehensive or complete inventory of fish passage barriers. The data set is updated continually as inventory efforts are ongoing.' Below the text is a 'Less' link with an upward arrow. On the right side, there is an 'About' section with the following text: 'WA Dept of Fish and Wildlife Open Data', 'Shared By: WDFWAdministrator', 'Data Source: fortress.wa.gov', and three links: 'View Metadata', 'Create Webmap', and 'Create a Story Map'.



# Interacting with FPDSI data

<https://arcg.is/1bvTiO>

The screenshot shows the ArcGIS Online interface for the item 'WDFW Fish Passage and Diversion Screening Inventory Sites'. The page layout includes a top navigation bar with 'Home', 'Gallery', 'Map', 'Scene', 'Notebook', 'Groups', 'Content', and 'Organization'. Below this is a blue header for the item name, with sub-tabs for 'Overview', 'Usage', and 'Settings'. The main content area is divided into three columns:

- Left Column:** Features an 'Edit Thumbnail' button, a map thumbnail of Washington State with colored overlays, an 'Add to Favorites' button, and a 'Description' section with an 'Edit' icon.
- Middle Column:** Contains a text description: 'This data set contains information on the location, type, and fish passage barrier status of fish passage structures in Washington State.' It also includes 'Map Image Layer by DFWHabitat', creation and update dates (Sep 15, 2020), a view count (10), and another 'Edit' icon.
- Right Column:** Contains a vertical stack of buttons: 'Open in Map Viewer' (with a dropdown arrow), 'Open in Scene Viewer', 'Open in ArcGIS Desktop' (with a dropdown arrow), 'Share', and 'Metadata'. Below these is an 'Item Information' section with a progress bar from 'Low' to 'High' and a 'Top Improvement' lightbulb icon with a link to 'Add terms of use'. At the bottom, there is a 'Details' section with 'Source: Map Service', 'Size: 1 KB', a five-star rating, and social media icons for Facebook, Twitter, and Email. A 'Share' button and an 'Edit' icon are at the very bottom.





# Future state

## Recently completed/planned work:

- Mobile data collection
- SQL backend updates to reflect updated methodology
- Frontend updates to accommodate mobile data collection
- Additional project specific map services
- Network analysis tools to find most downstream barrier or barriers upstream from a site

## Some other ideas for future:

- Utilize SQL spatial data types
- Exposing of closer to full schema for web services
- StreamStats API integration in web app
- Better reporting (SSRS or custom)





<https://arcg.is/1C901a>



# Questions?

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