

# MNDNR Culvert Inventory Suite - Instructions

---

## Overview

The **MNDNR Culvert Inventory Application Suite** was developed for the collection of culvert, bridge and stream crossing data in a standardized manner by professional staff across Minnesota, with the objective of building a statewide database of features which can be used for a variety of business-related purposes.

The suite consists of the following related components:

- ArcGIS FieldMaps Mobile Application – a mobile app for standardized data collection in the field
- ArcSDE Centralized Database – a database for multi-user editing and secure data storage
- MNDNR Custom Web Application – a DNR Portal web app for data review, approval and download
- Statewide GIS layers – custom layers auto-generated from approved features for distribution via the MN GeoSpatial Commons website.

For more information and access to additional resources, see the **MNDNR Culvert Inventory Application Suite** website at: [http://www.dnr.state.mn.us/watersheds/culvert\\_inventory/index.html](http://www.dnr.state.mn.us/watersheds/culvert_inventory/index.html)

---

WORKFLOW STEPS: Numbered bullets refer to sections in this document

Setup (in office)

- [Setup DNR Portal login and password](#)
- [1.2 Obtain a mobile device \(Android, IOS-Apple or Windows 10\)](#)
- [1.3 Download the FieldMaps for ArcGIS \(ESRI\) application](#)
- [1.4 Determine wireless connectivity in the field](#)
- 1.5 Open ArcGIS FieldMaps and choose a map
- [2.1 Create a custom basemap \(setup an area of interest\)](#)
- [2.2 Disable Wi-Fi and Cellular on your mobile device](#)

Data Collection (in field)

- [3.1 Enter Stream Crossing Summary data](#)
- [3.2 Add photo attachments](#)
- [3.3 Enter Culvert \(Openings\) and Bridges](#)
- [3.4 Edit feature locations and attributes](#)
- [4.1 Refine the GPS Utility Location](#)

Data Review/Approval (in office)

- [4.2 Sync the data to the SDE database](#)
- [5.1 Review and edit data in the DNR Culvert Inventory Web App](#)
- [6.1 Approving Data](#)

# MNDNR Culvert Inventory Suite - Instructions

---

## Section 1: Setup Instructions

### 1.1 Setup DNR Portal web application Login and Password

- **If you do not have logins and passwords set up prior to using the app, it won't work for you!**
  - If this is your first time registering for the **MNDNR Culvert Inventory Suite**, send an email to [Mike.Tronrud@state.mn.us](mailto:Mike.Tronrud@state.mn.us) and [Andrew.Williquett@state.mn.us](mailto:Andrew.Williquett@state.mn.us), 651-259-5244 and request to be added to the **Culvert Inventory group**
    - Mike will set up a login to **DNR Portal (for the Culvert Inventory Web App)**.
    - Andy will set up a login for the **ArcGIS FieldMaps - Culvert Inventory App**.

### 1.2 Obtain a mobile device

- The device must be an **Android** smartphone/tablet, **Apple** iPhone/iPad or Windows10 device
- Cellular capabilities are not necessary; users can “check-out” air photos within their area of interest (i.e., custom basemap) prior to heading into the field (see *Section 2*)

### 1.3 Download the FieldMaps for ArcGIS (ESRI) application for your device and install

- If using an Apple device, download app from the **Apple App Store**
- If using an Android device, download app from the **Google Play Store**
- If using a Windows 10 device and
  - you are a DNR employee, download app from the **DNR Microsoft Software Center** (from the device *Start Menu: All Programs: Microsoft System Center*). Contact MNIT Services if it doesn't appear there.
  - you are not a DNR employee, download app from the **Windows Store**
- Open the **ArcGIS FieldMaps app** and sign-in to **ArcGIS Enterprise (DNR Portal)** using your DNR Portal username and password (username format: *filastna@mndnr*)
  - Refer to this document if needed:  
[MNDNR Logging into ArcGISCollector via DNR Portal v1.0](#)

### 1.4 Determine whether you will have wireless connectivity in the field

- You should consider setting up a **custom basemap** in case the wireless connectivity is not available or becomes unreliable. Loss of a signal could cause you to lose unsaved data.

# MNDNR Culvert Inventory Suite - Instructions

---

## 1.5 Open ArcGIS FieldMaps and choose a map

Choose one of the following map forms from the **Maps** list: (or see **2.1 Create a custom basemap**)

- **Culvert Inventory – Long Form (Collector) – Production** (commonly used by MNDNR staff)
  - detailed attributes; follows the protocol and attributes from the [DNR Stream Crossing Full Assessment Form – Appendix D, p. 27-28 in the Stream Crossing Inventory and Barrier Ranking Guidelines, EWR 2015](#). Items marked (!!!) correspond to (\*) mandatory items on the form.
- **Culvert Inventory – Short Form (Collector) – Production** (commonly used by non-DNR staff)
  - limited attributes; follows protocol and attributes from the *MN Elevation Committee Interim Guidance on Acquisition of Culvert Geospatial Data* – Table 1, p. 5.

## Section 2: Create Custom Basemap

### 2.1 Create a custom basemap in the office (requires internet connectivity)

- From the **All Maps** page in the ArcGIS FieldMaps app, choose Download from the form you want to use (Long or Short Form, see 3.1 below); choose **Download a new basemap (imagery)**.
- Zoom to your chosen work area. (The box size is fixed.) Click “Choose Map Detail”. Ideally, it would be best to have the highest detail possible. As you zoom in to choose detail, it will display the work area file size. If the file size gets too large, reduce the extent of the work area or map detail. Total file size is based on work area extent + map detail/resolution. Click “download”.
- Select this custom basemap when in the field for data collection. Upon returning to the office and internet connectivity, choose “Sync” to send the collected features to the central database. In the All Maps window, on the lower blue bar, choose “Manage” under the 3-vertical-dot-icon to delete the custom basemap and/or the collected features.

### 2.2 Disable WiFi and Cellular on your mobile device

- If internet availability is not readily available, open your device or phone settings and turn off WIFI and Cellular services to avoid excess charges in the field. You can sync your collected data up to the central database when returning to the office.

# MNDNR Culvert Inventory Suite - Instructions

---

## Section 3: Data Collection in the Field (using the ArcGIS FieldMaps App)

### 3.1 Enter Stream Crossing Summary data

- Log into the ArcGIS FieldMaps Culvert Inventory App (*Section 1.3*) and choose a standard map (*Section 1.5*) or custom basemap (*Section 2.1*)
- Zoom and pan to your current location
- In the *Map* interface, select the *+ icon* and choose **Crossings**; mark a single point (usually in the middle of the road, bridge, or overpass)
- In the *Attributes* interface, enter attributes
  - Items with green triangles are **required** (*Surveyor, Crossing Type*)
  - Items with (!!!) are **required by Fisheries** for assessing barriers to fish passage and may be recommended for other users

#### *Tips:*

- *Begin typing to bring up values when a domain exists (e.g., typing 'Ja' under Surveyor will bring up names beginning with 'Ja' and also names containing those letters)*
- *Use the NEXT button to scroll to the next attribute*
- *Most numeric values can be entered to 0.01 (will be rounded in the database)*
- *Elevation values are in feet, range is: [600-2000] feet*
- *Add an attachment using the paperclip icon (take a photo with your camera or attach a pre-taken photo)*
- *When done, choose the checkmark to submit the feature*

### 3.2 Add photo attachments

- *Not completed...*

### 3.3 Add Culvert Openings and Bridge features

- When adding culverts, use two points (one for the inlet, one for the outlet)
  - Add the first point for the inlet and fill in attributes
  - Use *Copy Feature* (below) to make outlet point with the same attributes
    - Change the [end\_type] to 'outlet' and edit other attributes as necessary

### 3.4 Editing feature locations and attributes

- **To edit attributes**, go to the map and select the feature by clicking on it
  - Choose the attribute box that says *Stream Crossing Summary* on it
  - Choose the pencil icon to edit attributes; choose checkmark when done

# MNDNR Culvert Inventory Suite - Instructions

---

- **To move, delete or copy** a feature, select the feature:
  - Choose the gray triangle in the lower right corner of the attribute box, then choose:
    - *Move Feature* - click on a new location on the map; choose checkmark when done
    - *Copy feature* - choose to copy the attributes or location only; click on map to mark the new location of the copied point
    - *Delete feature* – deletes selected feature

## 3.5 Other icons

### 3-vertical-dot icon

- *Measure* - Place first and last point, measure is provided (for estimating culvert length, stream width)
- *Basemap* – change basemap
- *Layers* – turn layers on/off

### Bookmark icon

- Click and hold on any location on map
- A white text box with the location name and lat/long coordinates appears
- Under the 3 vertical dots icon, choose **Add to my places**

### Other recommendations

- **Test out all functionality** so you know how it works before heading into the field
- Note that placement of icons and menu items will differ among different devices (i.e., iPads, iPhones, Android, Windows10 devices). Examples above are for a Samsung 7 phone.
- For TEST data, add the word TEST in the QUESTIONS/COMMENTS attribute (you can search for and delete these later from the database)
- It is no longer necessary to add unique Crossing IDs to features. IDs will be auto-assigned in the DNR custom web app using a **Populate Crossings** tool.
- The ArcGIS FieldMaps app can use up lots of battery power, make sure device is charged up and you have extra charging cables/batteries. You may want to turn off (or at least close) the ArcGIS FieldMaps app during down time between data collections.

For Technical Support, please contact:

Andrew.Williquett@state.mn.us, 651-259-5244, Christopher.Pouliot@state.mn.us, 651-259-5491

# MNDNR Culvert Inventory Suite - Instructions

---

## Section 4: Post Data Collection

### 4.1 Refine the GPS Utility Location

- **Not completed...**

### 4.2 Sync the data to the SDE database

- If you have internet connectivity when in the field;
  - Your data will go directly to the centralized ArcSDE geodatabase. Upon returning from the field, you will be able to review your collected data in the **MNDNR Culvert Inventory Web Application** (see *Section 5*).
- If you did not have internet connectivity when in the field:
  - You can sync up your collected data with the ArcSDE geodatabase when back in the office. With internet connectivity, choose “Sync” from the ArcGIS FieldMaps app to send the collected features to the central geodatabase.
    - Verify that the features are visible in the **MNDNR Culvert Inventory Web Application** before deleting them from the ArcGIS FieldMaps app.
    - To delete features in ArcGIS FieldMaps: Go to the *All Maps* window and on the lower blue bar, choose “Manage” under the 3-vertical-dot-icon to delete the custom basemap and/or the collected features.

# MNDNR Culvert Inventory Suite - Instructions

---

## Section 5: Editing and Reviewing Collected Data (in the DNR web app)

### 5.1 MNDNR Culvert Inventory Web Application (in MNDNR Portal)

- Open the **MNDNR Culvert Inventory web application** using a current *Chrome* or *Firefox* browser:  
[https://arcgis.dnr.state.mn.us/faw/culvert\\_inventory/index.html](https://arcgis.dnr.state.mn.us/faw/culvert_inventory/index.html)
- **Important:** You must have first registered with the **MNDNR Culvert Inventory group** and have been assigned a user name and password. (See *Section 1.1*)
  - For assistance, contact Andrew.Williquett@state.mn.us, 651-259-5244
- If you are a MNDNR employee, you will use your 'normal' Active Directory PC user login and password; however, you still must register with the MNDNR Culvert Inventory group first.

### Web App: MENU Buttons

#### About This Application

- This button describes the web application and has links to online materials stored on the **MNDNR Culvert Inventory Application Suite** website at:  
[http://www.dnr.state.mn.us/watersheds/culvert\\_inventory/index.html](http://www.dnr.state.mn.us/watersheds/culvert_inventory/index.html)
- The slide-out panel shows the application *Version*, *Date Updated*, *Stage (Development or Production)*, *User Name (person logged into the app)* and their assigned *Role(s)*
- Different roles allow users to have different editing and approval capabilities
- See **Role Descriptions** (See *Section 6 – Approving Data* and *Appendix 1 – User Roles and Rights*)

#### Layers

- This button expands the legend to show the different symbols and approval status levels for *Crossings*, *Culvert Openings*, *Bridge Assessments* and *Breach Lines* features
- The five **Feature Status** levels are:
  - **Candidate** – preliminary status; all features are assigned this status by default
  - **Reviewed** – these features have been reviewed for accuracy and completeness by the *Data Collector* and are ready for approval
  - **Question** – these features have a question asked about them and are waiting for a response
  - **Approved** – these *Reviewed* features have been approved by the *Approver-Business* and will be added to the GIS layers for distribution via the [MNGeoSpatial Commons](#) website.
  - **Archived** – these un-editable features have been 'retired' by an *Approver\_Business* due to feature duplication, replacement, inaccuracy, etc.

# MNDNR Culvert Inventory Suite - Instructions

---

## Web App: MENU Buttons

### Search

- This panel allows the user to search for features based on locations and attributes
- Click on any search 'result' to zoom to that area or feature
- Adding a new search removes the results of the previous search (i.e., no compound searches)

### *Location Name*

- Searches for matching features in the following categories: *ama, county, lake, map100k, map24k, mcd, nwr, wma, wpa, section, sna, stfor, stprk, stream, township*
- **Note:** Searches are based on an external geographic location service and do not come from attributes of the features themselves

### *Address*

- Enter any part of a physical address
- **Note:** Searches are based on an external geographic location service and do not come from attributes of the features themselves

### *Public Land Survey*

- Enter a valid township [26-168], range [1-51], direction [east/west], section [1-36]
- **Note:** Searches are based on an external geographic location service and do not come from attributes of the features themselves

### *Search Multiple Fields*

- This box searches the following feature attribute fields: *Question, Crossing\_ID, Surveyor, Created User, Last Edited User, Notes and Comments, Recommended Actions*
- Searches are based on the attributes of the features themselves

### *Other searchable fields include:*

- *Date, Barrier to Fish Passage, Priority, Crossing Condition, Stream Fields (Stream Name, Kittle ID, Alternate Name, AUID), DNR Major Watershed, Road Path or Railway, Feature Status*

# MNDNR Culvert Inventory Suite - Instructions

---

Web App: MENU Buttons

Edit

- This panel shows the available **Edit Tools** (visible to all Roles except the *Data Viewer* role)
- **Set Status:** Approved and Archived options are only available to the *Approver\_Business*

To add, edit, move and/or delete data

You can add and edit data directly in the web application. If you collected data using the ArcGIS FieldMaps Culvert Inventory app or had data previously imported into the ArcSDE database, it will appear in the web application. All features are initially given a 'Candidate' status by default. (See *Section 6: Approving Data.*)

To add a new STREAM CROSSING feature (single point)

- Click on the EDIT tool to open the edit panel
- Select the CROSSING tool and click on the map to add a Stream Crossing point
- The attribute window will open; fill in or edit *Crossing Type\**, *Surveyor\** and *Field Date\** (*\*required*)
- **Note:** Yellow-highlighted attributes will be auto-populated; see 'To Auto-populate Spatial Attributes' (below)
- Fill in additional attributes as desired
- Choose **SAVE** at the bottom of the attribute form to save the feature and attributes

To add a new CULVERT feature (pair of points)

- Click on the EDIT tool to open the edit panel
- Select the CULVERT tool and click on the map to add a Culvert inlet point
- The attribute window will open; fill in *PIPE\_ID* ("1") and *Opening End* ("inlet") (*required*)
- **Note:** Crossing ID will be auto-populated; see 'To Associate Features with Crossings' (below)
- Fill in additional attributes as desired
- Choose **SAVE** at the bottom of the attribute form to save the feature and attributes
- Repeat above steps to add the culvert outlet point; use *PIPE\_ID* ("1") and *Opening End* ("outlet")
- Number additional culverts as 2,3,4, etc. with a pair of points (inlet and outlet) for each culvert

To add a new BRIDGE feature (single point)

- Click on the EDIT tool to open the edit panel
- Select the BRIDGE tool and click on the map to add a Bridge point
- The attribute window will open; there are no required attributes
- **Note:** Crossing ID will be auto-populated; see 'To Associate Features with Crossings' (below)
- Fill in additional attributes as desired

All Attributes

- Attributes marked with a red asterisk \* are required in the SDE database (DB-enforced)
- Attributes in **BOLD** are strongly recommended but not required (not DB-enforced)

# MNDNR Culvert Inventory Suite - Instructions

---

- *Tips:* Use the TAB button to scroll through attributes; use your mouse wheel to quickly increase and decrease numeric values
- **Important:** make sure to choose SAVE at the bottom of the attribute form to save your work

## To Auto-populate Spatial Attributes

- Click on the EDIT tool to open the edit panel
- Use the *Select* tool to select a CROSSING feature (*Tip:* draw a box around the crossing feature)
- Choose *Populate Crossings*
- This auto-populates the spatial attributes (highlighted in YELLOW) and adds a unique *Crossing ID* to the selected feature. Note that if you move the crossing you will get a message to rerun this function.

## To Associate Features with Crossings

- Use the *Select* tool to select a CULVERT or BRIDGE feature (*Tip:* draw a box around 1 or more features)
- Choose *Associate*
- This assigns the nearest *Crossing ID* to each selected feature, associating the crossing attributes with the culvert opening(s) or bridge feature(s)
- Note that a feature must be within 60 feet of the crossing or you will get an error. Move the culvert/bridge or crossing feature and re-run function if necessary.

## To Add Attachments to a feature

- Attachments such as images and documents can be added to features and stored in the SDE database along with the features
- Click on any feature to bring up the attribute pop-up window
- Under **Attachments:** (at the bottom of the attribute form)
  - Under Add: *Choose File* (navigate to where the file is stored; choose file and Open)
- To view existing attachments, click on one in the **Attachments** list
- To delete an attachment, click the red X next to the filename; SAVE

## To Move a Feature

- Click on a feature to get the attribute pop-up window (the selected feature will turn green with a yellow outline)
- Hover over the selected feature until the icon turns to a 'finger' icon; grab the feature and move it to the desired location
- **Important:** You must choose SAVE at the bottom of the form or the feature will revert back to its old location after panning
- *Tips:* Turn on the Aerial Photo background and use the mouse wheel to zoom in and out to accurately place the feature. When moving a point, the attribute window may sometimes pop up in the way. If so, grab the attribute window by its black header bar and drag it to a new location. Now go back and move your feature to the desired location. Make sure to choose SAVE after moving.

## To Delete a Feature

- Click on a feature to get the attribute pop-up window
- Choose Delete from the bottom of the form (SAVE is not needed after deleting a feature)

# MNDNR Culvert Inventory Suite - Instructions

---

## To Send a Question or Comment

- Use this button (at the bottom of the attribute form) to send a question or comment to either:
  - the MNIT development staff: (choose a name under the **Email To:** dropdown)
  - the *Surveyor* or *Created\_by* User: (manually type the name into the email pop-up window)
- Save changes
- Type your question or comment into the email body and Send
  - Sending an email will change the feature status to 'Question' (pink symbol)
- The receiver of the email will receive a link to zoom to and review the feature in question
- They will enter a response in the Question/Comment field and change the feature status to 'Reviewed', 'Approved' or 'Archived' as appropriate
- **Note:** only the *Approver\_Business* role and MNIT Staff can edit the **Question/Comment** field directly and change the status of this feature

## Web App: MENU Buttons

### Download

- All features may be downloaded from the web application.
- Choose the Download tool from the menu
- Choose the **Layer to Download:** *Crossings, Culverts, Bridges*
- Choose **What to Download:** *All Features* or *Selected Features* (use Selection Tool)
- Choose **Projection** (*UTM Zone 15, Lat/Long, Web Mercator*)
- Choose **Download** (button)
  - Data is downloaded as a .csv file with the feature type and date included in the file name
  - Data points may be added as an *Event Layer* to ArcMap by using the coordinate fields to map feature locations (see **ArcMap help**)

# MNDNR Culvert Inventory Suite - Instructions

---

## Section 6: Approving Data

### Overview

Stream Crossings, Culvert and Bridge data may be entered by several means:

- Using the **MNDNR Culvert Inventory ArcGIS FieldMaps App** (in the field)
- Adding data directly into the **MNDNR Culvert Inventory Web Application** (in the office)
- Submitting standardized data for upload into the **MNDNR Culvert Inventory ArcSDE** geodatabase

When registering as a user of the **Culvert Inventory Application Suite**, each user is assigned a user login, password and one or more roles. These roles may be: *Data Viewer* (read-only), *Data Collector* (\_Long or \_Short Form), *Approver\_Business* or *Admin*. User rights and responsibilities increase as the role moves from *Data Viewer* to *Admin*. (See *Appendix 1: User Roles and Rights* table.)

After data has been entered by any of the above means, it must be reviewed and approved by business staff. In general, **Data Collectors** are responsible for editing the data they have collected and for reviewing these features for accuracy and completeness. After reviewing the data, they change the data status to 'Reviewed'. If there are questions, they submit Questions or Comments to the **Approver (Business)**.

**Approvers (Business)** are responsible for approving the 'Reviewed' features for appropriate business-related uses. 'Approved' features are added to statewide GIS layers for public distribution via the [MN GeoSpatial Commons](#) website. *Approvers\_Business* also provide responses to *Questions and Comments*, and can archive features that are no longer needed.

A user's role may be changed by contacting [Andrew.Williquett@state.mn.us](mailto:Andrew.Williquett@state.mn.us), 651-259-5244. (Note: the approval of an existing *Approver\_Business* in your agency may be needed to increase your rights.)

### Recommended Workflow

#### Data Collector

- collects and enters data, either using ArcGIS FieldMaps app or directly into web app
- reviews data, checks for completeness, consistency and accuracy
- auto-populates spatial attributes
- associates culvert and bridge features with crossing features
- changes feature status to 'Reviewed'
- optionally asks a question about a feature

**Data Collectors** should do the following:

- Zoom to their features and review attributes and location
  - *Tip:* To find 'your' features, choose the Search button and enter your user name into the *Search Multiple Fields* box
    - To search *Surveyor* field, enter your last name e.g., 'Johnson'

# MNDNR Culvert Inventory Suite - Instructions

---

- To search *Created User* or *Last Edited User*, enter your 8-char format name e.g., 'tjohns0' for Tim Johnson
- Click on and zoom to each feature in the results list
- Click on any feature to bring up the attribute pop-up window
- Fill in any missing attributes, verifying entries for accuracy (SAVE)
- Add any attachments (SAVE)
- Zoom in and adjust the feature location if necessary (SAVE)
- Check that spatial attributes (in YELLOW) have been auto-populated
  - If you move the point, rerun this function.
- Check that crossing IDs have been assigned to each culvert and bridge feature
- Use the *Select* button to select a Culvert or Bridge feature and choose *Associate*
- If the wrong Crossing ID is assigned to a feature, edit it manually in the Attribute window
- If you have a question or comment about the feature, use the *Send Question or Comment* feature at the bottom of the attribute form. This feature will remain in 'Question' status until responded to by an Approver\_Business

## Approver\_Business

- reviews data in 'Reviewed' or 'Question' status
- sends questions to data collector if data is missing or seems inaccurate
- changes feature status to 'Approved' for addition to statewide layer on MN GeoCommons
- archives old, outdated, duplicate or replaced features

**Approver\_Business** users should do the following:

- Zoom to features having 'Reviewed' status
  - *Tip:* using the *Search* button, enter status='Reviewed' in the *Search by Feature Status* box
- Click on and zoom to each feature in turn
- Review the feature location and all attributes, verifying quality and accuracy for business-related uses (**Note: the required criteria is determined by each business unit or program**)
- If you have questions about a feature, use the *Send Question or Comment* function to send an email to the *Data Collector* or other authority
- To find features with questions, select the *Search* button, and enter status = 'Question' in *Search by Feature Status* box
- Type your response into the *Question* field and update the feature status; notify Data Collector if further action is required
- Retire old, inaccurate, duplicate or replaced features by changing feature status to 'Archived' and entering an *Archived Reason*

## GIS Data Layers

All features with an 'Approved' status will be routinely exported to statewide GIS layers made available on the **MN Geospatial Commons** at <https://gisdata.mn.gov/>. Search on keywords 'culvert', 'stream crossing', 'bridge' or 'breach lines'.

## MNDNR Culvert Inventory Suite - Instructions

---

Questions? Problems? Comments? We want to hear from you!

For **technical support**, please contact:

- [Andrew.Williquett@state.mn.us](mailto:Andrew.Williquett@state.mn.us), 651-259-5244 (MNDNR Culvert Inventory ArcGISCollector App)
- [Christopher.Pouliot@state.mn.us](mailto:Christopher.Pouliot@state.mn.us), 651-259-5491 (MNDNR Culvert Inventory Web Application)

For **field data collection** help, please contact:

- [Rick.Moore@state.mn.us](mailto:Rick.Moore@state.mn.us), 507-389-8810 (MNDNR Culvert Inventory ArcGISCollector App)

For questions about **breach line data** and associated QA/QC approval process:

- [Sean.Vaughn@state.mn.us](mailto:Sean.Vaughn@state.mn.us), 763-689-7100 x226

Ideas for **enhancements, training materials, content issues**:

- [Lyn.Bergquist@state.mn.us](mailto:Lyn.Bergquist@state.mn.us), 651-259-5189

# MNDNR Culvert Inventory Suite - Instructions

## User Roles and Rights

User Roles	Data Viewer (read only)	Data Collector (_Long or _Short)	Approver_Business	Admin
<b>Feature Status</b>				
<i>Candidate</i>		Y	Y	Y
<i>Reviewed</i>		Y	Y	Y
<i>Question</i>		Ask only	Ask/Answer	Ask/Answer
<i>Approved</i>			Y	Y
<i>Archived</i>			Y	Y
<i>Modify User Roles</i>				Y

Registered users can have multiple roles.

Rights increase as Roles move from *Data Viewer* (read-only) to *Admin* (all rights).

### Data Viewer Role:

- Has read-only rights; does not see EDIT tools in web application
- Can 'Send Question or Comment'

### Data Collector (\_Long\* and \_Short\*\* form users):

- Can edit their own data (if they are the *Created User*)
- Reviews/edits their own data for accuracy and completeness
- Can 'Send Question or Comment' but cannot edit the *Question* field directly
- Can change feature status to 'Reviewed'

### Approver Business Role:

- Can edit data created by other users
- Checks 'Reviewed' data for accuracy and completeness for *business-related uses*
- Can edit the *Question or Comment* field directly (can add responses to questions)
- Changes feature status to 'Approved'
- Changes status of old, duplicate or inaccurate data to 'Archived' and edits *Archived Reason* field

### Admin Role:

- MNIT staff only
- Has all of the rights of **Approver Business**
- Can add/delete/modify the roles of registered users

### ArcGIS FieldMaps forms

\* **\_Long Form:** used by most DNR staff and many project partners; has detailed attributes; follows the protocol and attributes from the [DNR Stream Crossing Full Assessment Form](#) – Appendix D, p. 27-28 in the *Stream Crossing Inventory and Barrier Ranking Guidelines, EWR 2015*

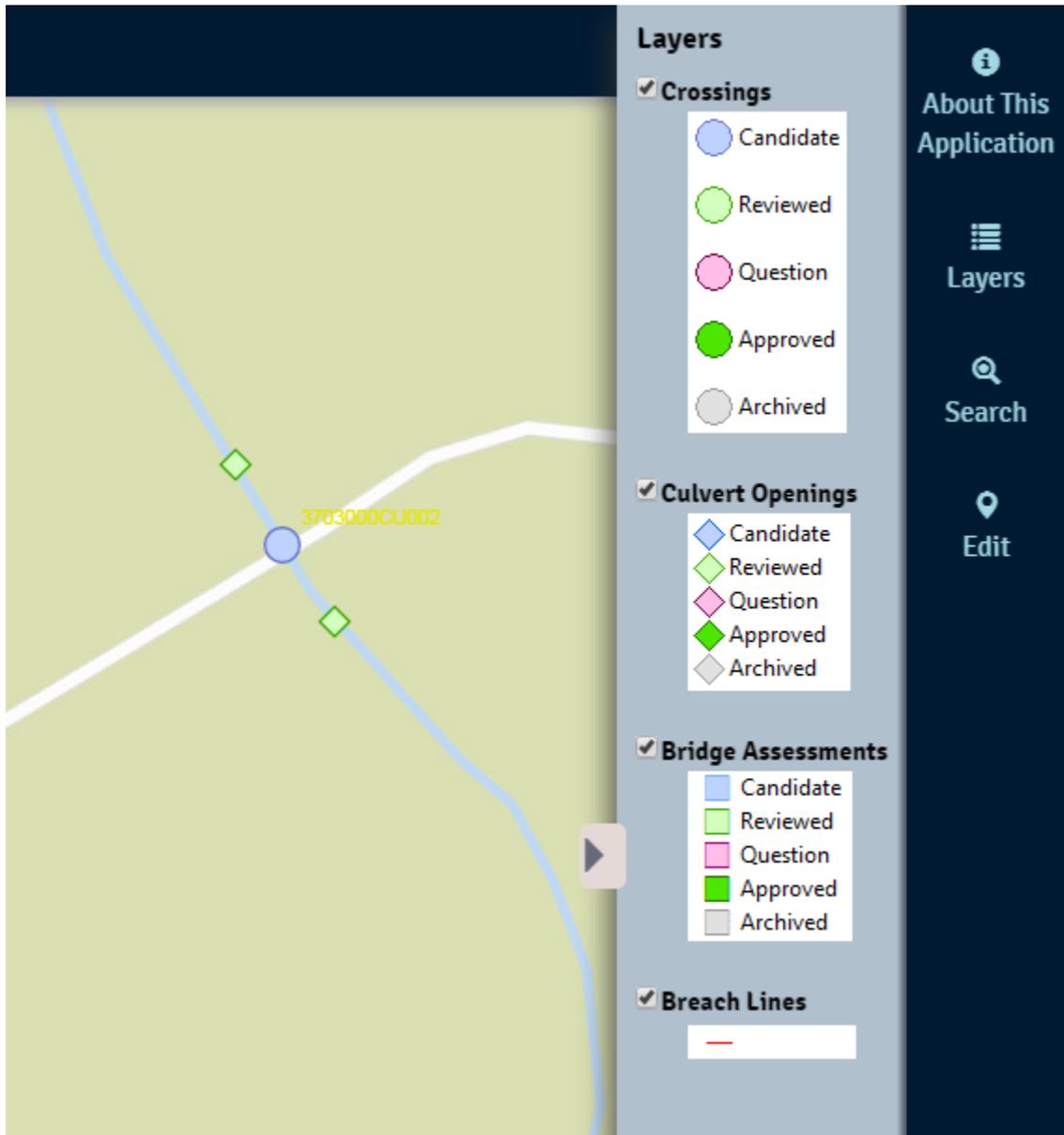
\*\* **\_Short Form:** commonly used by non-DNR staff; has limited attributes; follows protocol and attributes from the *MN Elevation Committee* – [Interim Guidance on Acquisition of Culvert Geospatial Data](#) – Table 1, p. 5.

# APPLICATION SCREEN PRINTS

## LAYERS

Example: Application display screen with Layers and Main Menu bar

The application display shows one stream crossing ('Candidate' status) with two culvert openings ('Reviewed' status). The Main Menu bar includes options for *About this Application*, *Layers*, *Search* and *Edit*. The *Layers* menu shows features symbolized by 'Feature Status'.



# MNDNR Culvert Inventory Suite - Instructions

## SEARCH

Example1: Location Name

Searches all location types for name containing keyword within any part of the name, e.g. 'hill'. Note that different types of features are found (map24k, lake, mcd, sna). Click on one entry in the resulting to zoom to that feature.

**Location Name**

Name	County	Type
Anchor Hill	Clearwater	map24k
Anchor Hill 2	Clearwater	lake
Anchor Hill 3	Clearwater	lake
Arden Hills	Ramsey	mcd
Avon Hills Forest SNA	Stearns	sna
Bay Hill Pond	Washington	lake
Cahill	Clearwater	lake
Cahill Lake	Beltrami	map24k
Churchill	Pine	lake

**Address**

**Public Land Survey**

West  East

**Search Multiple Fields**

**About This Application**

**Layers**

**Search**

**Edit**

# MNDNR Culvert Inventory Suite - Instructions

---

## SEARCH

Example2: Location Name

Searches multiple fields. **Hover** over the text box title to see which fields are searched. Click on one entry in the resulting list to zoom to that feature.

Searches these fields:  
-QUESTION  
-CROSSING ID  
-SURVEYOR

**Search Multiple Fields**

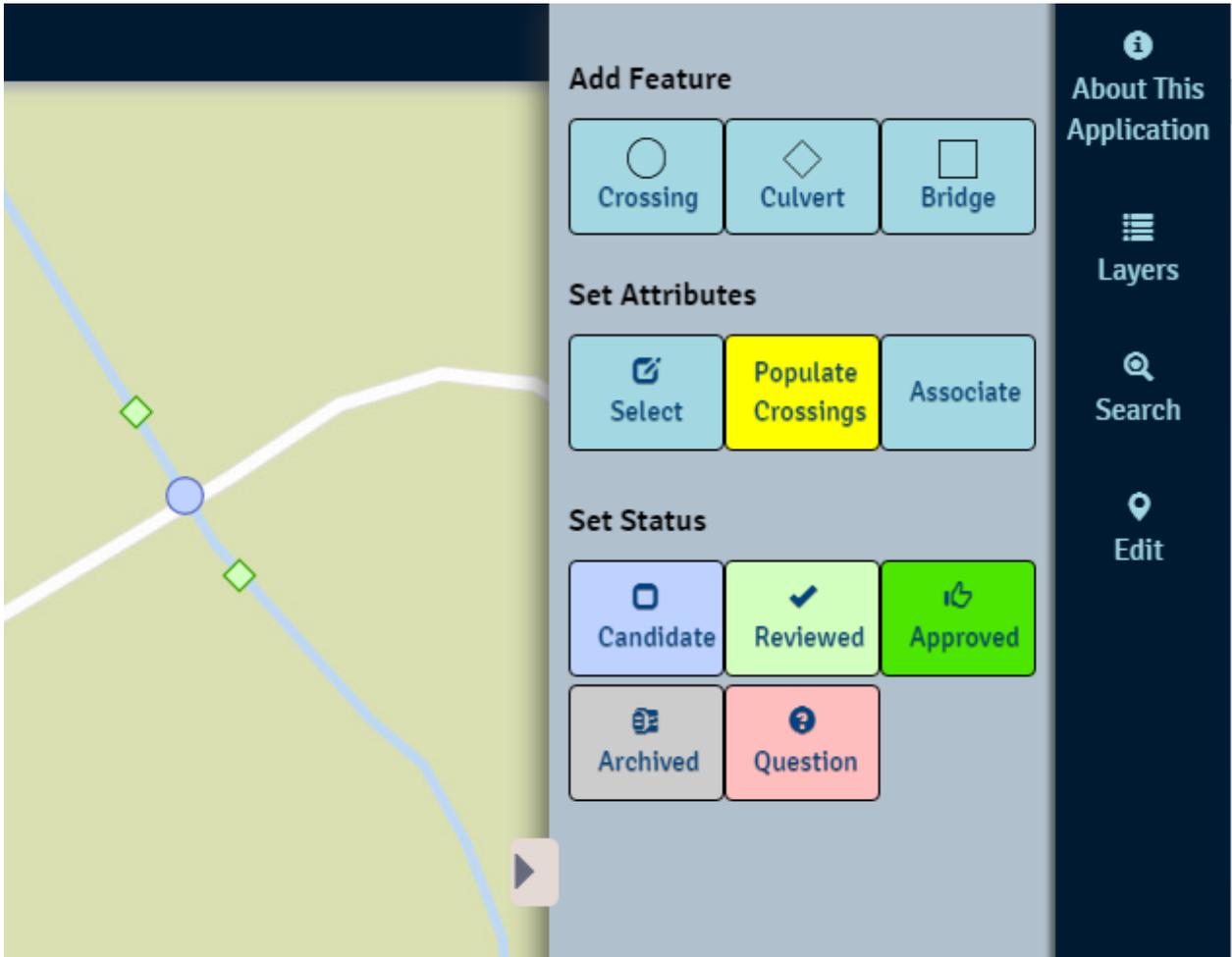
Layer	Crossing ID
Crossings	null
Crossings	3703000CU001
Crossings	3703000FD001
Crossings	3703000CU002

# MNDNR Culvert Inventory Suite - Instructions

## EDIT

Example: Edit Tool bar (not available if user role = Data Viewer)

Edit tools allow user to *Add Feature*, *Set Attributes* and *Set Feature Status*. Different tools are active based on **User Roles**.

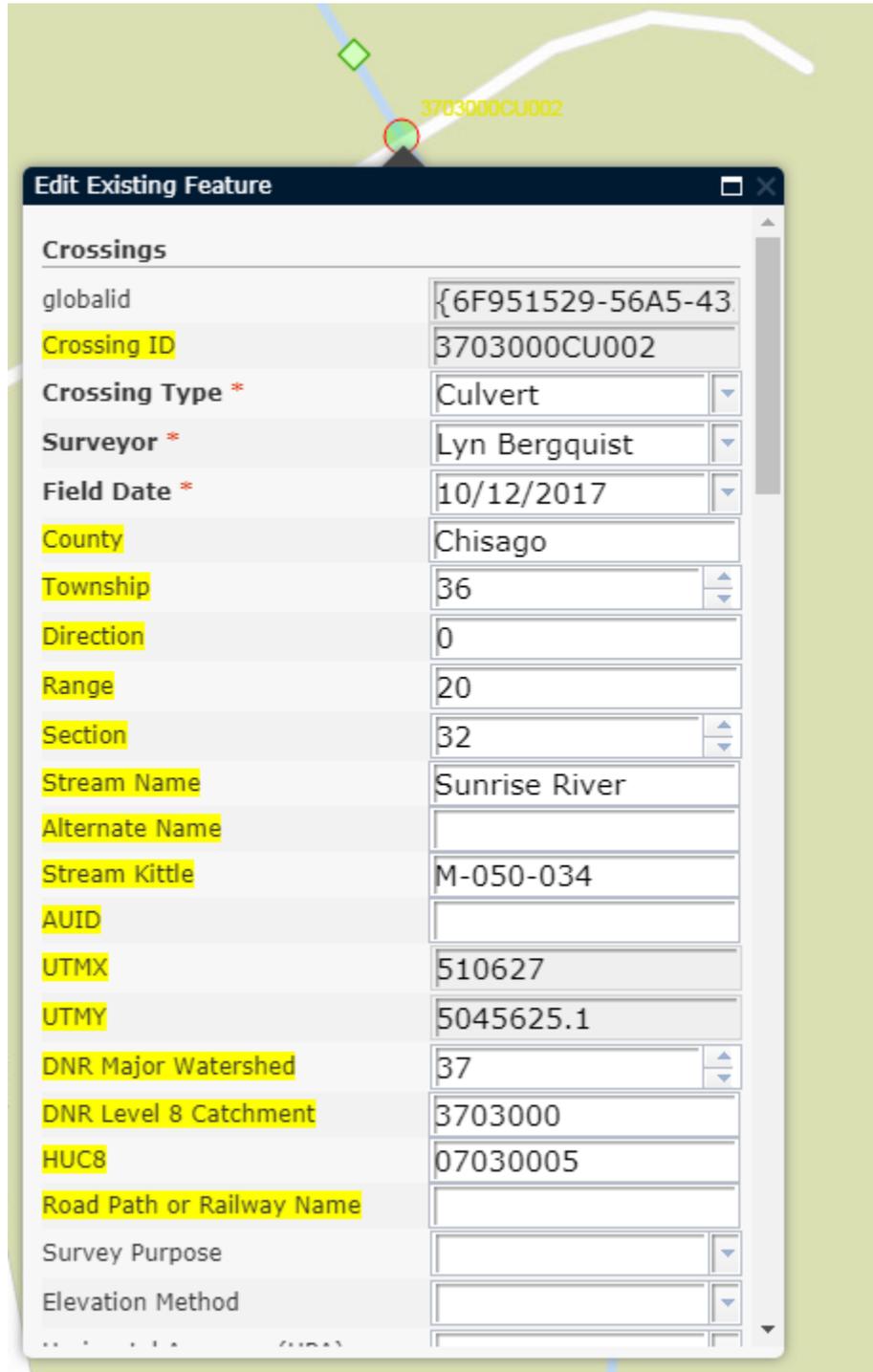


# MNDNR Culvert Inventory Suite - Instructions

## ATTRIBUTES

Example1: Attribute pop-up form for a Crossing feature

Attribute pop-up window where attributes may be added and edited. Many attributes have drop-down value lists to aid in standardization.



# MNDNR Culvert Inventory Suite - Instructions

## ATTRIBUTES

Example2: Bottom of attribute pop-up form with additional buttons

At the bottom of the Attribute pop-up window are options to **Add Attachments** (images, documents), **Delete** or **Save** a feature and **Send Question or Comment**.

The screenshot shows a window titled "Edit Existing Feature" with the following fields and controls:

- Third Limiting Factor for Passage:
- Fourth Limiting Factor for Passage:
- Recommended Corrective Actions:
- Notes:
- Created User: lybergqu
- Last Edited User: lybergqu
- Feature Status: Candidate
- Question/Comment:
- Archived Reason:
- Attachments:**
  - None
  - Add:  No file chosen
- Edited 18 minutes ago
- Buttons: