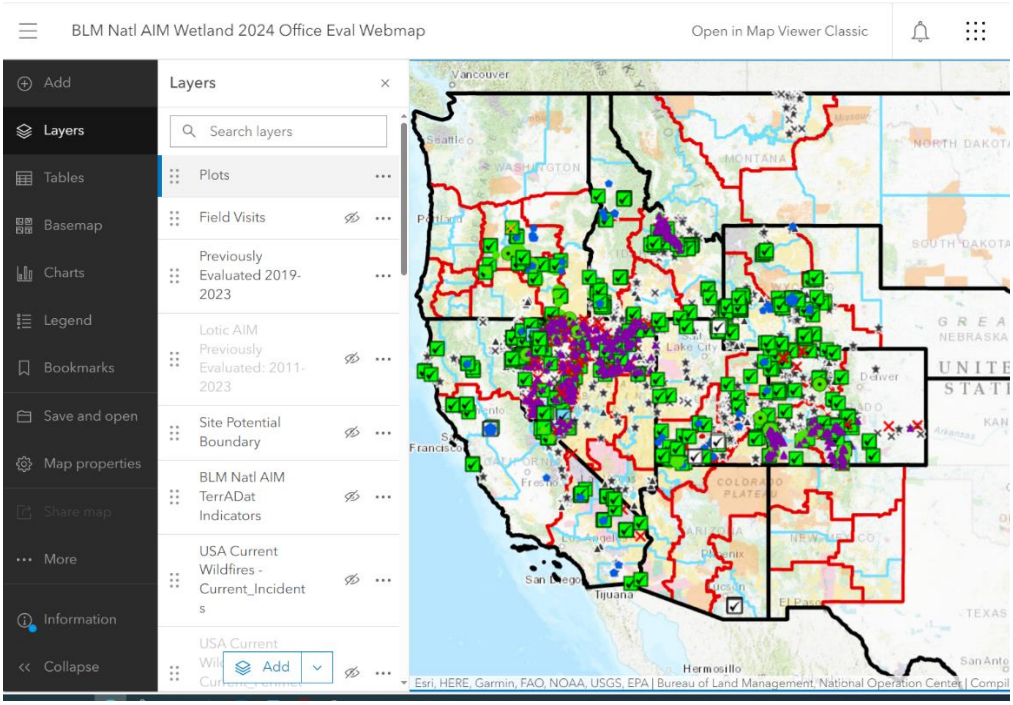
BLM's Riparian and Wetland Assessment, Inventory, and Monitoring (AIM)

Design Management and Site Evaluation Protocol

2025 Field Season



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Produced by BLM National Operations Center (NOC) and Colorado State University (CSU)'s Colorado Natural Heritage Program (CNHP)

1. Introduction and Design Concepts

A. How to use this protocol

This protocol expands on the concepts of design management and site evaluation, as discussed in Section 3 of the Field Protocol for Lentic Riparian and Wetland Systems. Design management consists of five iterative steps (Figure 1), which are outlined in the step-by-step instructions below. For each of the five steps, the protocol outlines the responsible parties, required files and tools, and detailed instructions. Supporting information including design concepts, definitions of key terms, and design tool information are provided in the glossary and appendix sections. Specifically, terms formatted with ***bold and italics*** are defined in the glossary. ***'Layer'*** names referenced from a webmap will be bolded and italicized with single quotes. '*Field names*' (column names) will be italicized with single quotes while "values" in a specific cell of a table are indicated with double quotes. Webmaps including the office evaluation webmap, targeted site submission form, and draft design dashboard are available through the BLM AIM Riparian and Wetland - Overview (geoplatform account) and BLM AIM Riparian and Wetland - Overview (blm-egis account).

B. What is Design Management and Site Evaluation?

Design management is the process of documenting site evaluation outcomes, both office and field-based (Figure 1). Proper design management is important to ensure the correct plots are sampled to maintain the statistical validity of your sample design and the subsequent inferences drawn from collected data. As part of design management, site evaluation is an extensive process. Site evaluation includes determining whether a site meets the definition of the target population, documenting the route and permissions used to access the point coordinates, and creating a preliminary sampling plan. Design management and site evaluation begin prior to the start of the field season and continue until the desired sample size is met for the entire sample design.

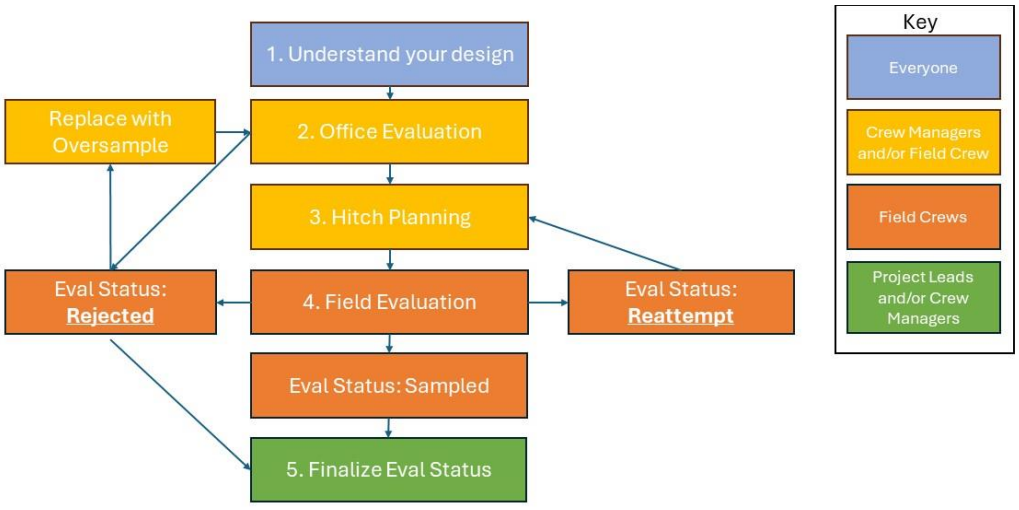


Figure 1. Design management workflow for Riparian and Wetland AIM.

C. Design concepts

Sampling Approach

Projects in the Riparian and Wetland AIM program may follow different strategies for sampling a given **target population,** typically a **random** approach or a **targeted** approach. It is crucial to understand the approach used for a given project to ensure successful implementation. The approach used to select a given Plot will be indicated by the *'Sampling Approach'* field in the ***'Plots Layer'*** (Table 2 in Appendix 2):

D. Random Approach

In a **random approach**, **random** points are selected randomly across the landscape in a spatially-balanced way. Data from the plots sampled will be used to draw inference to the target population across the whole area of interest. These designs require structured implementation to maintain statistical validity. In most cases, the target population is defined by riparian and wetland areas mapped by the National Wetlands Inventory, though particular projects may use different riparian, wetland, or spring mapping products. Some random designs may also be divided into smaller **strata** for the purposes of sampling or analysis. During evaluation, **strata** essentially operate as independent designs, each with their own draw order and replacement points.

Target Population

The target population refers to the resources intended to be described by the sample design. In statistical surveys, the target population refers to the group of individuals that one seeks to make inference about. In a random sampling approach, this generally includes the riparian and wetland ecosystems defined in Section 1.2 of the field protocol. For all areas in the Western U.S. except Alaska, the following field criteria may be used to define the target population for the Riparian and Wetland AIM program:

Criteria for applicable ecosystems (Field protocol Section 1.2):

- **Perennial vegetation**: At least 10% cover of perennial vegetation under typical growing season conditions without disturbance (e.g., heavy livestock use, wildfire, or flooding).
- **Hydrophytic vegetatio**n: Within existing cover, a dominance of hydrophytic vegetation (OBL, FACW, or FAC species).
- **Hydrology**: Evidence of hydrology influenced by surface or groundwater at some point in the growing season.
- **Limited scour channel**: The majority of the monitoring plot must be beyond the immediate banks of an unvegetated active river or stream channel.
- **Shallow water**: No more than 10% cover of permanent standing water deeper than 50 cm (20 in) during the growing season.
- **Sufficient area and width**: Sufficient area to accommodate three 25-m transects with individual transects spaced at least 5 m apart. Small segments less than 2 m wide can be included, but the majority of the monitoring plot should be at least 2 m wide.

All random plots should fit these criteria unless otherwise specified by monitoring objectives. See section 1.2 of the AIM National Aquatic Monitoring Framework: Field Protocol for Lentic Riparian and Wetland Systems for more details.

The default **sample frame** for **random** sampling of riparian and wetland resources is based on the National Wetland Inventory (NWI) dataset by US Fish and Wildlife and includes decades of digitized data. These data, though comprehensive, have a slightly different target population than the R&W AIM program. Furthermore, R&W AIM has additional sample criteria which might exclude some areas included in the NWI. For example, wetland areas with naturally low vegetation cover, such as playas, are often included in the NWI dataset, but excluded from the R&W target population. Finally, outdated mapping and temporal variation in wetland extent may also contribute to imperfect overlap between the two target populations. For these reasons, Site evaluation is an essential part of the process to ensure the sites selected in GIS do match the criteria for what we wish to sample.

Currently representative sample draws are created through the GRTS sample design method which is informed by the monitoring design worksheet (MDW). To meet monitoring objectives, and obtain accurate central tendency and variance estimates of the population, we need to sample the target sample population. A point created in GIS may overlap the NWI dataset but may not always be in our target population. We always need to make sure we are sampling the target population: i.e. a wetland or riparian area point selected in the design meets the six criteria above on the ground. If making statistical inference about the population of wetlands and riparian areas in our study area, we need to ensure we have an adequate sampling effort.

NOC staff will post draft designs to the **draft design dashboard** for design review by BLM staff. Once approved, those points will be migrated over to the Office Evaluation Webmap for individual point evaluation.

The design management workflow enables us to evaluate proposed sampling sites, to ensure they are part of the target population, and if not to replace them with a sampling point that helps ensure we are meeting the requirements of the design. Highest priority, “Base” points start with 1 in the *‘PriorityOrder’* field of the Office Evalution Webmap and increase sequentially and continuing into the “Over”, the oversample points. “Base” points are also indicated as “Base” in the *‘BaseOver’* field. Points should be evaluated starting with 1 in the *‘PriorityOrder’* field in order. Oversample points which replace base points if they are rejected continue the same sequence in *‘PriorityOrder’*. All “Base” points should be evaluated by the end of design evaluation and either sampled or replaced with a point from the oversample. If a smaller portion of “Base” points will be sampled during a particular sampling season, rejected points should be replaced with the next base point with the lowest ‘PriorityOrder’.

E. Targeted Approach

Targeted points are manually selected by BLM field and district office staff based on specific monitoring goals and should be entered via the **targeted site submission form** with **site potential**

boundaries if applicable. Data from these plots cannot be used to make inference to a larger area. Frequently, targeted sampling is used for site-specific monitoring objectives (eg, treatment effectiveness) or where wetland mapping is outdated and inadequately represents the areas project leads are most interested in. As the data from each plot will stand on its own, these plots have less strict plot shifting and replacement rules, but require extra attention to ensure sampling will support the monitoring goals of BLM staff. For targeted sampling, BLM staff may provide more sites than they expect to be sampled in a season. Highest priority, "Base" points will have a 1 in the *'PriorityOrder'* field and "Base" in the *'BaseOver'* field, while backup points will be indicated by a 2 in *'PriorityOrder'* and "Over" in *'BaseOver'*.

A given project may use a random or targeted sampling approach exclusively, or they may select points using a mixed approach, where some points come from a random design and are supplemented by additional targeted points. For all projects, crews should make sure they know how many plots they need to sample of each type using the ***'ProjectInformation'*** table in the Office Evaluation Webmap.

F. Evaluation (Eval) Status

At the beginning of the season, all plots will start with an evaluation (*'EvalStatus')* status in the office or field webmap that matches their sampling approach (random or targeted) and priority (base or oversample). As the season progresses, plots can be reassigned to other eval statuses based on information gained during office and field evaluation. Note crews will also assign an analogous 'Sample Status' in the Site Evaluation form during every field visit. This sample status will reflect the status during a particular visit, while the 'EvalStatus' in the ***'Plots'*** layer will reflect the final evaluation status by the end of the current sample season. Crew Leads are initially responsible for changing these statuses until a particular plot is either Sampled or Rejected. At this point, Crew Managers and/or Project Leads are responsible for reviewing these Plots and approving the data collected by the crew. Evaluation statuses should be finalized at the end of the field season by Crew Managers or Project Leads either in the office evaluation webmap or in the Data Review Dashboard after the data is reviewed.

- "Ready for field visit": A plot that has been office evaluated, but a crew has not yet attempted to sample. "Ready to field visit – Backup" can be used for sites that have been office evaluated but may be lower priority than the points specifically planned for sampling.
- "Sampled": When a plot is sampled, it is considered a member of the ***target population***, data are collected, and the data are later used for analysis and reporting. Data from all sampled plots should be reviewed by the Project Lead or Crew Manager by the end of the season. At this point the status can be changed from "Sampled – Waiting for data review" to "Sampled – Data reviewed."
- "Rejected": A plot that was not sampled because it was found to either be permanently inaccessible or did not fall in the target population. A plot may be rejected during either office evaluation or during a field visit. All permanent rejections must be reviewed and approved by project leads and/or crew managers by the end of the season. At this point the

status can be changed from "Rejected – Waiting for project manager approval" to "Rejected – Project manager approved".

- "Reattempt": A plot that was not sampled or partially sampled due to a temporary access or safety concern or was visited for reconnaissance purposes.

G. Reason Not Sampled

Plots classified as either Reattempt or Rejected must have an accompanying reason as to why the plot could not be sampled ('NotSampledReason' in the webmap). There are many different reasons a plot may not be sampled, but they fall into three main groups. Each reason is described in more detail in Table 1, and in Section 3.3 of the Riparian and Wetland AIM Field Protocol. The evaluation statuses shown below are shown in Table 1 are in hierarchical order, meaning a site that was both non-target and inaccessible should be labeled as non-target.

- Non-target: The sample location was not within the target population, either due to prevalence of upland vegetation, low perennial cover, size, permanent deep water, or administrative boundaries. Non-target sites are removed from condition estimates of riparian and wetland acres and instead used to adjust the total size of the sample frame.
- Permanently inaccessible: The sample location did fall in the target population but is not sampleable due to permanent access issues or safety concerns. The decision to classify a site as permanently inaccessible should not be taken lightly, as omitting plots can create 'holes' or gaps in the design, thus reducing the design's statistical rigor (see section below 'Holes in the design').
- Reattempt: The sample location was within the target population, but data was not collected because the visit was reconnaissance, or the location is temporarily inaccessible. The sample location should be reattempted in the future.

Table 1. General sample (evaluation) status and specific reasons for unsuccessful outcomes of a sample location. Descriptions apply to the sample location and all area within 50 m. (Table 3 of the Riparian and Wetland AIM field protocol).

Sample status	*Reason not sampled*	*Description*
Sampled	**NA**	Sample location successfully sampled with a full plot and all completed field methods.
Non-target	**Uplands**	Sample location is upland. The vegetation is not dominated by hydrophytic species and is not influenced by surface or groundwater.
	No perennial vegetation	Sample location contains <10% perennial vegetation during a typical growing season (e.g., not following heavy livestock use, wildfire, or flooding).
	Permanent deep water	Standing water at the sample location is deeper than 50 cm across more than 10% of the sample plot and is unlikely to recede.
	Size	Wetland area cannot accommodate three 25-m transects or is less than 2 m wide.
	Administrative boundary	The sample location does not fall on lands administered by the appropriate agency.
Permanently Inaccessible	**Access denied, private**	The sample location can only be accessed by crossing private land and landowner permission was explicitly denied.

Sample status	*Reason not sampled*	*Description*
	Access denied, terrain	All possible routes were attempted, but natural barriers such as cliffs, slopes greater than 50 percent, waterfalls, or permanently deep water prevented access.
	Distance prohibitive	The sample location falls more than 5 km (3.12 miles) from a road or UTV path and transit time by foot is excessive. The specific distance threshold can be adjusted depending on programmatic goals.
Reattempt Needed	**Different route or permission needed**	The crew was unable to gain access to the sample location but could gain access at a later date with landowner permission or by taking a different route.
	Temporary deep water	Water at the sample location was deeper than 50 cm at the time of visit but will likely recede later in the season.
	Recon visit	The site was visited as a reconnaissance trip, sampling criteria have been met, and information helpful for the future sampling crew has been noted.
	Seasonality	Sample location meets all criteria, but the vegetation was unidentifiable because the visit was too early or too late in the season
	Recent disturbance	Recent flood, fire, or other disturbance that has caused significant impact on the vegetation, but is likely to recover within the season or in the next season.
	Other	The crew started to access or sample but ran out of time; the crew was turned back by inclement weather; the sample location will require a backpacking crew, more capable truck, or all-terrain vehicle because it is remotely located or access road is too rugged; or various reasons not listed above, including safety issues such as illegal activities or active wildfire in the vicinity of the sample location.

H. Base and Oversample

All designs are made up of two types of points: an initial set of points, called the "base", that must either be Rejected or Sampled by the end of the season, and a second set of "oversample" or backup plots used to replace rejected plots from the base sample. This information shows up as the '*BaseOver*' field for a particular plot.

- **Base:** Plots that correspond to the desired sample size for a given *'DesignStratum'*. For targeted points, these correspond to the highest priority sites as designated by project leads, while in random designs, these are the points with the lowest draw order. Ideally, all base plots would be successfully sampled and no oversample plots would be needed. However, for a variety of reasons, base plots are frequently rejected and subsequently not sampled. The number of points in a particular *'DesignStratum'* assigned as "Base" in the *'BaseOver'* field of the '***Plots'*** layer indicates the target number of plots to be sampled during the current field season.
- **Oversample:** Plots that are used as replacements for points that are rejected or cannot be sampled.

While the concept of "base" and "oversample" originally comes from random designs, it has been applied to targeted sites to clearly communicate desired sample numbers and sampling priorities from project leads to crews. Targeted designs typically have an oversample of 1 oversample for every 5 base points. Base and oversample points from random and targeted sampling approaches

should be considered separately, meaning a rejected random base site should be replaced with a random oversample from the same stratum, **not** a targeted oversample.

I. Additional Considerations for Evaluating Random Designs

1. Evaluation of random designs and sampling order

All sampling locations in a random design should be sampled in the order in which they appear within each ***stratum***. As a rule of thumb, start by evaluating and sampling base plots (i.e., the lowest *'PriorityOrder'*) for each stratum. If a plot (base or oversample) is rejected, replace it with the first random oversample plot within a given stratum (lowest *'PriorityOrder'*) to achieve the desired sample size. *'PriorityOrder'* is a sequential number assigned to each plot within each ***stratum*** and used to ensure plots are in the correct order to achieve a spatially balanced design.

Evaluate all base points in each ***stratum*** first. Then assess the base point failure rate for each stratum by counting the number of inaccessible or nontarget points. Use this failure rate to estimate how many oversample points may be needed per ***stratum,*** plan sampling efforts, and assess whether there are an adequate number of points available for this year's sampling effort. For example, if, during office evaluation, there are ten base points and five are rejected, ten more oversample points are likely needed to ensure five more sampleable points on average. Having more oversample points than necessary is preferable to running out of points before completing a design. If during the field season it seems as though an insufficient number of oversample points were drawn in the design to achieve desired sample sizes, contact the National AIM Team.

If points are sampled out of order it is important that no holes are left in the design by the end of the field season (see 'Holes in the design,' below).

2. Holes in the design

Sampling plots out of order in random designs or having lots of inaccessible plots can cause 'holes' in the design. Holes result from "inaccessible" or "unknown" plot designations that fall between evaluated plots, which includes sampled plots. Holes occurring in clusters so that certain areas are undersampled, introduces bias into the design. *As a rule of thumb, ensure that holes do not make up >30% of evaluated plots (excluding non-target).*

Some holes are inevitable due to denied access through private property or unsafe access or sampling conditions. Depending on the desired sample size, one or two holes in a ***sample design*** are generally acceptable. However, if too many plots are classified as "inaccessible" or "unknown", systematic bias will be created that impacts condition estimates. For example, if all inaccessible plots are in remote wilderness areas with minimal anthropogenic impacts, excluding these plots from your analysis could result in worse overall condition estimates for the study area than if those plots were sampled.

When managing a design, it can be difficult to determine how much effort should be expended sampling difficult plots because the number of holes in the design is unknown. As design

implementation progresses, the importance of putting extra effort into accessing very remote points, or those with otherwise difficult access issues, will become more obvious.

2. Understanding Design Management Tools

A. Overview:

Once a design has been finalized, the National AIM Team will make the design points available for office and field evaluation during the field season. At this point, implementation may begin. All parties involved in design implementation should take some time to understand the tools available for tracking sample design implementation.

Responsible Parties: Everyone

Tools:

- **Office Evaluation Webmap**: Webmap used for tracking all design points and associated information resulting from point evaluation. This tool should be used on a computer, not a tablet. Information entered into this webmap will be automatically synced to the field webmap when the crew is online.
- **Field Evaluation Webmap:** Webmap used for field crews to use in the Field Maps application on their iPad. All information entered into this map should be synced to the field visits layer of the Office Evaluation webmap when a crew returns from the field.

B. Detailed tool orientation: Use the above tools to explore available features before beginning to evaluate your design.

1. Access the Office Evaluation Webmap
    a. All users must be added to the Riparian and Wetland AIM Group on AGOL to access design materials. Contact Ruth Whittington (Ruth.Whittington@colostate.edu) if you need to be added to the group.
    b. Contractors may first need to create a geoplatform account before they can be added. Find the instructions for this in Section I of the Riparian and Wetland AIM Technology Manual (Appendix A of the Data Management Protocol).
    c. To navigate to the webmap, first go to 'Groups' in ArcGIS Online. There you should find the BLM AIM Riparian and Wetland group. Field and Office Evaluation Webmaps will be linked in the main group description as soon as they are ready for the upcoming field season. Additionally, webinars are also available to guide you through webmap orientation and site evaluation in the office eval webmap.
2. Orient yourself to the Office Evaluation Webmap
    a. Review quick start guide in Appendix 1 to navigate the features found in the Office Evaluation Webmap.
    b. Review all layers.

i. The ***'Plots' layer*** is where all steps during office evaluation will be documented. See Appendix 2 Table 2 for metadata on all fields in the '***Plots' layer*** and read carefully before beginning to edit.
ii. See the list below for a description of other layers found in the Office Evaluation Webmap.

c. Add layers from ArcGIS Online
   i. The webmap as managed by the National AIM Team will have universally useful layers. There may be additional layers available for an area or region. Use the Add button to search for helpful layers to use during office evaluation.

d. Filter the Webmap for your use
   i. Office Evaluation: *'AdminState'* and *'Project'* can limit the plots to a state, district, or field office to make office evaluation more manageable. *'DesignStratum'*, *'SamplingApproach'*, or '*PriorityOrder'* may also be used to sort or filter the webmap during various times of the evaluation process.
   ii. Trip Planning: It may help to filter plots to only those with an *'EvalStatus'* of "Ready to Field Visit" or with a particular hitch indicated.
   iii. Finalizing Eval Status: *'Project'* and *'EvalStatus'* can help filter '***Plots'*** to those with statuses indicating data review is still required before finalizing the *'EvalStatus'* for the season.

e. Edit '***Plots'*** layer to change *'EvalStatus'*, add Office Evaluation information and access instructions.
   i. Edits should be made by clicking the on the sample point in the map and opening the 'Editing feature' form.
   ii. Do not use the 'Edit' toolbar outside the form.
   iii. Use the 'Update' button to save changes.
   iv. Column names with padlock icons are locked and cannot be edited. If the attribute name does not have a padlock icon, you can double click the cell for editing. If unsure, reach out to the National AIM team!
   v. If you cannot edit the table, you may need your permissions upgraded on your AGOL account. BLM users can accomplish this by submitting a helpdesk ticket. Geoplatform users will need to have a BLM sponsor work to upgrade their permissions.

3. Saving your map
   a. To save the filters, extent, symbology, or other changes you made to webmaps, you can click the Save As button in the webmap. This will save aesthetic features of the map to a user's contents folder in AGOL, while maintaining the map's connection to the data underlying the layers contained in it. This means all other map users *will not* see changes to the map layout itself, but they *will* continue to see any attribute edits made to the Plots layer.
   b. While saving a map can allow users to curate a map to their specific purpose, it will also remove the map from central management by the National AIM Team. In some cases, edits the National AIM Team makes to the webmap may

interfere with data collection. *For this reason, it is recommended that users remake and save their map starting from the original webmap every 1-2 weeks*.

4. Understand how the Office Webmap interacts with the Field Webmap and ***'Field Visits'*** layer.
    a. The ***'Plots'*** layer should only be edited on a computer by those responsible for Design Management and Office Evaluation tasks.
        i. Edits to the '***Plots'*** layer will automatically transfer to the Field Evaluation Webmap, providing crews with information to use during their site visit. Tablets need to be synced with the online webmap before the edits will show up.
    b. The '***Field Visits'*** layer should only be edited by crews from the Field Evaluation Webmap on their iPad through the Field Maps application.
        i. Visits added to the ***'Field Visits'*** layer on crew iPads will show up on the Webmap when the Field Maps application is synced to ArcGIS Online.

C. Layers in the Office Evaluation Webmap

For all layers in the webmap, additional information may be available in the item description. Find this by clicking the three dots below a particular layer in the content pane of the webmap. This should open a dropdown with "Show Item Details" at the bottom.

***'Plots'*:** Used to view all plots in a design for a given year and track progress towards completing planned sampling. This layer tracks:

- Evaluation Status across the season (*'EvalStatus'* column)
- Reasons a particular site was not sampled and lines of evidence used to reject a Sample Location from the office (*'NotSampledReason'*, *'RejectionReason1'* and *'RejectionReason2'*)
- Contingent and supplemental data to be collected at each plot
- Comments and general information (Office evaluator, directions, plot layout comments, etc.)
- Additional information provided by project leads that might provide recommendations on plot layout, sampling time, or access instructions (*'BLMComments'*, *'SamplingTime'*, *'Monumenting'* columns).

For a complete list of fields see Appendix 2, Table 2.

***'Field Visits'*:** Layer used to track individual field visits to a particular plot.

- Every time a crew visits a Sample Location, whether they rejected or sampled it, a new field visit should be submitted with a unique *'EvaluationID'*. This field visit and associated *'EvaluationID'* will be used for all forms associated with that sample visit, even if the sampling occurs over two days. Each *'PlotID'* may have multiple field visits, each with their own unique *'EvaluationID'*, before it is successfully sampled.
- Each visit should have an appropriate *'VisitType'* indicating what kind of data were collected. For "Rejected" and "Reattempt" visits, a Site Evaluation form should also be filled out to track additional information on why the site was not sampled.
- Possible *'VisitTypes'* include:

- "Full Sample Visit" is the most common type of sampling event during which all Core methods and requested contingent methods are applied.
- "Permanent Rejection" is used for non-target or inaccessible sites which will never be able to be sampled.
- "Temporary Rejection" is used for reconnaissance visits or temporary access issues that prevent full sampling.
- "Annual Use Visit" is used for sampling events during which only annual use data will be collected.
- "Calibration Visit" is used to launch all forms used for a calibration event.
- "AK Full Sample Visit" is used by crews in Alaska. Because these field visits have different form requirements, we've separated theses field visits out for QC purposes.
- "Small Site Pilot Sample Visit**"** is used for small site pilot visits.

'Site Potential Boundary': Some project leads may submit targeted sites where management action is expected to change the extent of riparian and wetland area. This will be indicated in the BLM Comments field of the plots layer, where it will either indicate "Plot can be established in the existing wetland or riparian area" or "Plot should represent site potential". In cases where the plot should represent site potential, they may help guide sampling by submitting potential site boundaries through the targeted site submission form. Site potential boundary polygons will automatically sync with the Office Evaluation Webmap as soon as forms are submitted.

'Riparian and Wetland AIM Previously Evaluated' **:** This layer contains a record of every Plot that has been previously evaluated as part of the Riparian and Wetland AIM Program. This layer should be used as a reference layer while office evaluating points to prevent duplicated office evaluation efforts across years and to learn from previous evaluations. Access information can be particularly useful, but plots that have previously been rejected should not be written off as rejections this year. Rather, evaluators should consider if plot conditions may have changed across years and the validity of previous evaluations. This layer will appear as you zoom in closer to an area on the map. See complete list of fields in Table 3 in Appendix 2.

'Lotic AIM Previously Evaluated': This layer contains a record of every reach that was previously evaluated as part of the *Lotic* AIM Program. This layer can be helpful to gather information on access and the availability of water during previous field visits from previous years, updated yearly.

'BLM Natl AIM TerrADat Indicators' Indicators from TerrADat Hub, updated yearly BLM Natl AIM TerrADat Hub - Overview. This contains a record of every plot that has been sampled as part of the Terrestrial AIM Program. This can give users an idea of where Terrestrial AIM data is available to inform sampling efforts.

***'Project Information'*:** This table will show up at the bottom of the Contents tab of the Office Evaluation Webmap. This will contain information about expectations for a given project as directed by the Task Order, including Contingent and Supplemental methods that need to be applied, the number of sampled plots required, and the anticipated balance between targeted and random plots.

Layers for assessing whether a site falls within the target population:

***'USA Wetlands'* :** National Wetlands Inventory polygons mapped across the entire US. This layer is usually what random plots are drawn from. Opening pop-ups from this layer can tell you more about how a particular site was classified in this nationally implemented wetland mapping program. USA Wetlands (Mature Support) - Overview

Additional Imagery layers: Allows for viewing imagery from multiple time points.

***'Sentinel-2 Views'* :** Imagery layer updated regularly, depending on cloud cover. May be used to see a recent image of a particular area. (ESRI) Sentinel-2 Views - Overview

'USA NAIP Imagery' : This contains several layers highlighting particular aspects of imagery, including Infrared (darker tones indicate moist soils, red colors indicate actively growing plants) and NDVI (Normalized Difference Vegetation Index; shows relative biomass of an area) updated yearly (ESRI) USA NAIP Imagery: Color Infrared - Overview

Layers for gathering additional information about a site

'Vegetation Management Treatments' : Available for only some states (NV), updated yearly.
NV BLM Vegetation Treatments - Overview

'BLM Natl Fire Perimeter by Decades': Open the dropdown to turn on particular decades and check to see whether a particular site has burned, last updated 2019 BLM Natl Fire Perimeter by Decades - Overview.

Layers for trip planning and predicting field conditions

'Surface Management Agency': Layers showing surface management agency, with BLM-administered lands shown in yellow.(BLM static polygon last pulled in 2024) Surface Management Agency - BLM Only - Overview

'USA Roads' : Major roads, highways. May not include smaller unpaved roads or two tracks (2022 data from US Census TIGER line geodatabase) USA Roads (Mature Support) - Overview

'USA Current Wildfires' : US Current Incidents and Perimeters (ESRI Live Feeds from IRWIN and NIFC information USA Current Wildfires - Overview)

'Air Quality and Smoke Site Data': AirNow's Air Quality and Monitoring Site Data hourly air quality data on the AQI(air quality index, EPA) AirNow Air Quality Monitoring Site Data (Current) - Overview

'National Weather Service Smoke Forecast': NWS Hourly Smoke Forecast for next 48 hours in the Continental United States. Concentrations are reported in micrograms per cubic meter (NOAA, ESRI) National Weather Service Smoke Forecast - Overview

3. Office Evaluation

A. Overview

The purpose of office evaluation is to: (1) determine whether the sample location or surrounding area is likely to meet the definition of the target population; (2) verify if the sample location is accessible and, if so, plan a travel route; (3) develop a preliminary plan for laying out the monitoring plot and (4) finalize plot's final *'EvalStatus'* at the end of the season and if applicable, *'NotSampledReason'*. The process can include, but is not limited to: reviewing aerial imagery, topographic maps, riparian and wetland mapping, and other ancillary spatial information; compiling previously collected monitoring or assessment data; consulting with field office resource specialists for local knowledge; and contacting private landowners to obtain access permissions and instructions.

Through the process of Office Evaluation, evaluators prioritize points that need to be field visited and manage successful implementation of a particular project's design. In random designs, rejected points need to be replaced by oversample points until the desired sample size is met – see 'Evaluation of random designs and sampling order' design concept. For targeted points, crews must communicate with project leads to ensure sampling fits monitoring goals for a particular site. This process requires iteratively updating the *'EvalStatus'* throughout the season and finalizing this field at the end of the season. All points are assigned "Random – Base", "Random - Oversample", "Targeted - Base" or "Targeted - Oversample" as their *'EvalStatus'* at the beginning of the field season to properly symbolize the points on the Webmap. *'BaseOver'* is a noneditable field that permanently stores "Base" or "Oversample" designations.

Responsible Parties: Crew Lead, Crew Manager, and Project Lead (support)

Tools: Office Evaluation Webmap

B. Process Overview:

Document decision-making process in the ***'Plots'*** layer of the Office Evaluation Webmap. See below for a list of items to consider when deciding a site's qualification, access, and sample plan.

1. Review sampling requirements for plots to qualify for the Riparian and Wetland AIM program.
    a. A complete definition of applicable ecosystems is found in Section 1.2 of the Riparian and Wetland AIM field protocol. Read this section before proceeding with office evaluation. Only random plots need to be evaluated for meeting the criteria.
    b. All monitoring plots may be shifted a maximum of 50 m from the sample design location, thus the entire area within 50 m of the sample location should be evaluated.
    c. Different potential plot layouts are described in Section 4 of the Riparian and Wetland AIM field protocol. Careful consideration should be given to the potential plot layout during the office evaluation process. If a site has previously been sampled (as shown by the '*PreviouslyEvaluated*' field, the plot will need to be laid

out as close to the original layout as possible. See 'Revisit Sampling' below for more information.

d. While random sampling must adhere to strict definitions of the Riparian and Wetland target population and shifting limitations, targeted sites have more flexibility based on the goals of the project lead who chose the sites. Evaluators and crew leads should do their best to ensure their sampling plan for targeted sites matches the goals of the project by communicating with the project lead. If a targeted site obviously does not fit the target population, evaluators may need to contact the project lead to make sure they understand the Project Lead's monitoring goals and what area they are hoping to capture with an R&W AIM plot.

2. Understand project sampling requirements.
    a. Use the Project Information table at the bottom of the contents panel to determine the number of targeted and random points that are required for sampling during the field season.
    b. Information on contingent and supplemental methods can be found in this table. Project Leads and Data collectors should communicate about which sites require supplemental sampling and how data from those methods should be collected. Supplemental methods are not covered during Core methods AIM trainings or in AIM documentation.
3. For each plot in a design, determine whether the sample location meets the definition of the target population. See 'Evaluate whether the sample location is accessible.' below for more information.
    a. Make notes about site evaluation in the *'OfficeEvaluationNotes'* field in the ***'Plots'*** layer.
    b. If a site does not meet the definition of the target population change the *'Eval Status'* to "Rejected – Waiting for project manager approval".
        i. Fill in the *'NotSampledReason'* to be "Non-Target", with the correct rejection reason found in Table 1.
        ii. Office rejections require that Office Evaluators offer two lines of evidence filled out in *'RejectedReason1'* and *'RejectedReason2'*. What were the tools you used to determine the designation (e.g. local knowledge [give name if not yourself], imagery, SMA, etc.)?
        iii. All rejections, office or otherwise, need to be reviewed and approved by either Project Leads or Crew Managers. After review, the *'EvalStatus'* may be updated to "Rejected – Project manager approved".
4. If a site does meet the definition of the target population, determine if the location is accessible. See 'Evaluate whether the sample location is accessible' below for more information.
    a. If a sample location is not accessible, change the *'EvalStatus'* to "Rejected – Waiting for project manager approval".
        i. Fill in the *'NotSampledReason'* to be "Permanently Inaccessible" with an appropriate rejection reason found in Table 1.
        ii. Fill in *'RejectedReason1'* and *'RejectedReason2'* with two lines of evidence used for the determination.

5. If a site is determined to be within the target population and accessible, create an access plan for the plot. See 'Planning a route and writing access directions' below for more information.
    a. Write full turn-by-turn access directions in the *'AccessNotes'* field of the ***'Plots'*** layer. See below for suggestions on mapping a route to the plot.
    b. Once at the site, these same directions can be updated based on information gathered during the trip, then copied and pasted directly into field forms, so it benefits the crew to write detailed directions from the office.
    c. If a site has previously been sampled, the plot will need to be laid out as close to the original layout as possible. See 'Revisit Sampling' below for more information.
6. Consider how the plot will be laid out and use the *'PlotLayoutComments'* field to document. See 'Creating a sampling plan' below for more information.
7. Once a plan has been developed for sampling, change the *'EvalStatus'* to "Ready to field visit". Sites that are fully reviewed but of a lower priority can be changed to "Ready to field visit – Backup".
8. Evaluators gaining experience in office evaluation may need to review plots several times as they gain confidence in the evaluation process.
    a. A field, *'AdditionalGuidanceNeeded'*, provides a space to flag plots for follow-up with project leads. Note this field is for use by evaluators and crew leads and will not directly communicate questions to Project Leads. Questions directed at Project Leads should be handled through email or phone outside of the webmap.
    b. As plots are reviewed, evaluators should compile a list of questions or example borderline sites they need extra guidance on. Consult with Crew Managers, Project Leads, or members of the National AIM Team outside the webmap to clarify recurring issues.
9. Finalize *'EvalStatus'* if needed in the Office Eval Webmap or in the Data Review Dashboard. Make Sure a *'NotSampledReason'* is filled in if applicable.

C. Site qualification, access, and ownership considerations

1. Evaluate whether the sample location falls within the target population.

This is more of a concern for random sites as targeted sites are directed by BLM staff to be sampled, whether or not they are within the target population.

Turn on the ***'BLM NatlSMA Cached with Private and Unknown'*** layer and zoom into plot to ensure it is on BLM land. Use various layers and basemaps in the Office Evaluation Webmap to help verify that the sample location or an area within 50 m of the sample location will pass each of the six Criteria for Applicable Ecosystems Field protocol Section 1.2):

- Perennial vegetation: At least 10% cover of perennial vegetation under typical growing season conditions without disturbance (e.g., heavy livestock use, wildfire, or flooding).
- Hydrophytic vegetation: Within existing cover, a dominance of hydrophytic vegetation (OBL, FACW, or FAC species).
- Hydrology: Evidence of hydrology influenced by surface or groundwater at some point in the growing season.

- Limited scour channel: The majority of the monitoring plot must be beyond the immediate banks of an unvegetated active river or stream channel.
- Shallow water: No more than 10% cover of permanent standing water deeper than 50 cm (20 in) during the growing season.
- Sufficient area and width: Sufficient area to accommodate three 25-m transects with individual transects spaced at least 5 m apart. Small segments less than 2 m wide can be included, but the majority of the monitoring plot should be at least 2 m wide.

Potential considerations:

- For targeted plots, did the BLM contact provide additional context about sampling in the *'BLMComments'* field?
    - Some targeted points may not qualify for the six criteria of applicable ecosystems. If a targeted site does not seem to qualify, this may be due to two possible reasons:
        - The BLM Project Lead expects the site to improve in the future due to a change in management, so it is expected to meet the six criteria in the future.
        - The BLM Project Lead may be unaware of the criteria for applicable ecosystems.
    - Evaluators should communicate with the BLM Contact provided to ensure they will get the data they expect from the point they submitted.
    - For communicating potential plot boundaries, the Targeted Site Submission Form can be used by BLM staff to demonstrate the area around the sample location in which they would like the plot to be established. Once submitted, the polygon drawn using this form will automatically sync with the Office Evaluation Webmap.
- Random plots *must* fall within the target population. In some cases, plots can be rejected from the office when enough evidence is available to suggest it will not be sampleable. In other cases, borderline sites may require a field visit to verify that a site does not qualify for sampling.
- Using various imagery sources and years, is the area consistently a bright green color suggesting wet conditions?
- Do NDVI or Color Infrared imagery sources suggest the plot will be covered with vegetation and wet?
- Is the potential area wide enough to fit one of the plot layouts? Use the measuring tool to explore dimensions of sampleable area.
- Is the plot classified in the National Wetlands Inventory (***'USA Wetlands'*** layer in Webmap). If so, how is it classified?
- Are there previously sampled Riparian and Wetland AIM Plots in the area? Has this Plot been previously sampled or rejected?
    - If a point in the Previously Sampled layer does not appear on the webmap, the PlotID may be used to search in the layer. If a previous field crew was not able to physically reach the sample location in the past, it may appear in a different location (i.e. at the location of a locked gate).
    - If the site appears in the previously sampled layer as "Reattempt" or "Permanently Rejected", why was it not sampled?

    - If the site was visited in the past, Crews will need additional information and photos to ensure the plot is placed exactly how it was placed previously. Communicate with the National AIM Team for that information.
- Are there previously sampled reaches from Lotic AIM in the area? Can you get any more information about conditions on the ground from other data sources?
- Is the sample location and/or sampleable area located on land managed by the BLM?

2. Evaluate whether the sample location is accessible.

The *'BLMComments'* field in the ***'Plots'*** layer may contain information about site qualification and access. If there are questions about a site after reviewing the 'BLMComments' field, refer to the *'BLMContact'* for that site.

Once a site is determined to be within the target population, check that the site is accessible, both in terms of available roads to the area as well as terrain. Plots further than 5 km from roads or UTV path may also be rejected. Potential factors to consider when evaluating access might be:

- A link to Google Maps directions is available in the pop-up in the Office Eval Webmap. While these directions can provide a general idea of how to get to a particular site, they should not be viewed as definitive. Use imagery in Google Maps and knowledge of private land ownership to evaluate the route suggested.
- Are there special access instructions available in the 'BLMComments' field? Do you need follow-up with BLM staff to check a particular route?
- What is the land ownership of the route you are planning?
    - Typically, BLM, State, and USFS managed land does not pose access issues. (There are some exceptions in the case of wildlife refuges, certain logging areas, or seasonal road closures that may pose access issues.)
    - BIA (Bureau of Indian Affairs) and DOD (Dept of Defense) land usually have some access restrictions.
    - Private land should be avoided whenever possible. (This does not apply to municipal areas or areas with regular through traffic.)
    - If a private landowner needs to be contacted, resource specialists in the BLM field office may be able to help.
    - If there are issues you can't resolve, make a note to check in with the BLM contact to see if they have any suggestions.
- What is the slope of the area around the sample location? Be aware of any significant changes in topography (e.g. cliffs) and plan accordingly. Google Earth can help assess the maximum slope of a given walking route and whether particular routes should be avoided.
- Are there any major stream crossings planned? Should the season be taken into account to ensure safe passage across a channel? The USGS Water Dashboard can be used to check stream flows in advance.

D. Planning a route and writing access directions

Make sure to provide detailed, step-by-step directions in the *'AccessComments'* section of the ***'Plots'*** layer.

- Don't forget to check whether BLM staff have provided access instructions already. In some cases, information from the *'BLMComments'* field can be directly copied and pasted into the '*AccessNotes'* field.
- Start with an obvious location or landmark (such as a small town or mile marker on a highway) that can be easily accessed using a navigation application. Then, using a measuring tool in AGOL or Google Earth, select path and use miles as the measuring unit. Use the measuring tool to measure approximate mileage between each turn and helpful landmark (corral, water tank, power lines, etc.). In the field, it is important to keep track of the odometer to avoid taking wrong turns.
- Satellite imagery can be helpful in determining which roads allow you to access the site most efficiently.
- Don't just rely on Google Maps (or other map apps)!! Google maps can be a useful tool, but it can be extremely unreliable when used for navigation on 4x4 and gravel roads. Consider the following when deciding the reliability of 4x4 and gravel roads:
    - Is the road clearly visible throughout its length?
    - Are there significant sections where the road runs in a straight line? Or is the road mostly winding? Generally speaking, dirt and gravel roads that have fewer curves and run in a straight line for long distance are more regularly maintained than winding roads with lots of curves and turns.
    - How much elevation change happens along the road? Is there a better route to circumvent any unnecessary elevation changes?
    - Try to prioritize time spent on solid straight roads over time spent on windier roads or 2-tracks. It may appear that the winding road directly to a site is a shorter distance, but the time spent navigating over rough terrain almost always outnumbers the time spent traveling on a graded gravel road.

E. Revisit sampling

If a site has been visited during a previous field season, additional information about the previous visit may be required, including transect locations, photos, and a plot drawing. A separate field evaluation webmap will be provided specifically for revisits which will include layers for the GPS locations of transect start and ends and plot center. To use this map in the field, field crews will need to download a separate offline area for the plots they will be visiting. Photos will be provided for revisits in the corresponding state folder of the AIM Riparian & Wetland Field Work Teams in a folder, *"Previous site visit data"*. These should be downloaded for offline use so they may be used in the field when sampling the site. Field crews should review their resources before leaving service to sample these points, and, if additional information would be helpful for sampling, reach out to the National AIM Team for the information they need.

GPS locations from previous samples will include some level of GPS inaccuracy (typically 6 m or less), so crews locating transects should use a combination of GPS locations and aspects found in

the revisit field map, as well as plot drawings and photos from the previous visit to layout their plot as close to the original layout as possible. In addition to plot layout information, site visit summary documents will include all data collected by the previous crew, including species lists and classification information. However, rather than relying on the decisions of the previous crew, crews should collect data based on what they observe during sampling, as conditions may have changed since the first site visit.

Annual Use visits are a special kind of revisit, where BLM staff or contractors plan to revisit a site during the same field season to collect annual use information at an appropriate time. This will be indicated in the *'CollectAnnualUse'* field in the ***'Plots'*** layer by "YesBLMStaff" or "YesSecondVisitContractCrew". The timing of the second visit will need to be communicated with the National AIM Team so they can prepare a revisit package and provide GPS locations for transect beginning and end points once the first field visit has occurred. See Appendix 3 for guidance specific to Annual Use revisits.

F. Creating a sample plan

If a site will be visited during the field season, crew leads should prepare for their visit while they have online access to additional information. Using imagery and other available data, crew leads should spend some time planning plot layout and gathering any additional information that may provide additional context for sampling while additional information is readily available online. Potential considerations include:

- Can a spoke layout fit at the sample location? Considering transects radiating 30 m out from plot center at 0, 120, and 240 degrees, will any transects hit upland or administrative boundaries?
- If not, is there an obvious place within 50 meters to shift the plot? What are the rough dimensions of that area? Which plot layout makes the most sense?
    - See Section 4 of the protocol for additional information on possible plot layouts.
- Are there any particular requirements on the plot layout based on BLM Staff monitoring goals and comments?
- Are there potential seasonal limitations to sampling?
    - High elevation sites may require a later sampling date because they take longer to thaw in the spring than low elevation sites.
    - Sites with major stream crossings may require later sampling to allow water levels to subside.
    - Certain ecotypes may dry faster than others and need to be sampled earlier, i.e., some mesic wet meadows dry faster than Riparian Shrublands which frequently have water later in the season.
    - The field *'SampleTiming'* in the ***'Plots'*** layer may have some suggestions about the best sampling time from project leads. If no information is provided, office evaluators may use the field themselves to indicate any seasonal sampling limitations they want to consider during trip planning.
- Is there any other information you should be aware of during sampling using other layers available in the Office Evaluation Webmap?

4. Hitch Planning

A. Overview

Once a Plot is determined to likely be within the target population and accessible, they can start to be grouped together into hitches for sampling. Hitch planning is an iterative process that should be re-assessed after each hitch, at which point all plots that were field visited should be updated to reflect their new Eval Status, either Rejected, Reattempt, or Sampled. Based on the sampling goals for the season, changes may need to be made to avoid design holes and ensure high priority sites are sampled.

Responsible Parties: Crew Leads and Crew Managers

Tools: Office Evaluation Webmap

B. Step-by-step instructions:

1. Select groups of points that are spatially close together while considering the following:
    a. Crews can typically sample one plot per day with some exceptions
        i. At the start of the field season when the crew is less experienced, it may take more than one day to sample a plot, particularly those with challenging layouts and high species diversity.
        ii. Woody sites may sometimes take more than one day to sample due to the difficulty of moving through the plot.
    b. Depending on travel time, crew experience, plot complexity, and the likelihood that sites will be rejected, crews should plan to sample 5-6 plots during an 8-day hitch.
        i. Efficiency will depend on the travel time to and from the sampling area.
        ii. After the first hitch, crews may need to budget some time on the first day of the next hitch to resolve errors that were flagged during QC before heading out.
        iii. Additionally, time should be budgeted for unknown plant ID and data review and submission, often as the final day of the hitch. As crews become more experienced, this may not be as necessary.
    c. When selecting points geographically close together, always consider the *'PriorityOrder'*.
        i. Random sites: Ideally, sites should be sampled in order. If order is not followed exactly, crews must ensure that by the end of the season, all sampled plots follow the priority order with no holes left (see 'Evaluation of random designs and sampling order' section of design concepts). Oversample sites should only be sampled when field crews are confident that all sites with lower *'PriorityOrders'* will be rejected or sampled.

ii. Targeted sites: More sites may have been submitted than a field office expects a crew to sample. The *'BaseOver'* field may be used to guide which sites are most important for crews to sample.

d. In addition to the points intended for field sampling, it is highly encouraged to add several additional sites in the event that sites are rejected or temporarily inaccessible.
    i. These backups may apply to specific sites, i.e. if your hitch is going to take place in two areas, make sure you have backups in both of those areas.

2. Review evaluation fields in the ***'Plots'*** to determine if additional information or contacts are needed.
    a. Review Office Evaluation fields to determine the amount of time that should be budgeted for each plot, considering the hiking distance, likely site complexity, and access difficulty.
    b. Review information about private landowners or field personnel that should be contacted and allow for enough time to do so before the hitch begins.
    c. Review *'AccessNotes'* to determine if supplemental maps or information is needed. When reviewing maps, pay particular attention to areas that could prohibit access, like cliffs or private land.
3. Create a list of points to visit on the hitch.
    a. Based on the above, create a list of sites to attempt to visit on a given hitch. The hitch plan template provided in Appendix 4 can be used as a guide. Alternatively, contractors may have their own hitch plan template they prefer to use.
        i. The list should include the order that the sample points should be visited.
        ii. A list of backup points should be included with notes such as "sample this site if site x fails" or "sample if extra time".
        iii. In the ***'Plots'*** layer, use the *'Hitch'* column to record which points should be sampled during each hitch. Be sure to update this field at the end of each hitch.
        iv. The *'HitchNotes'* field can be used to make notes about this year's sampling that will not be preserved for future use. Gate codes, contacts, hitch sampling order, and anticipated challenges are examples of things that could go into this field.
    b. Hitch plans should be sent at least a week in advance to the BLM Project Leads whose office is being sampled so they know when to expect crews.

C. <u>Tips for hitch planning:</u>

- Filter the ***'Plots'*** layer by your specific *'Project'*, and filter plots that have an *'EvalStatus'* of "Ready to field visit" to help narrow the list of points to work with.
- Schedule sites with long difficult hikes or high site complexity for the start of the hitch when the crew has more time and energy.
- Plan easy points at the end of the hitch in case the crew is running short on time and energy.

- Plan easy points for the entire first hitch of the season, then harder points for the middle of the season.
- Consider local phenology, snowpack, monsoon season, and irrigation withdrawals when planning the best timing for each hitch. Avoid areas with late season snowpack early in the field season and avoid areas prone to monsoonal rains during the mid to late field season. In general areas at lower elevations experience earlier peak plant flowering than those at higher elevations. Areas at higher elevations also experience a shorter growing season, so the window to sample those sites is much more limited.

5. Field Evaluation

A. Overview:

Field crews can sample, not sample, or delay sampling of a plot to another hitch. Field crews are responsible for recording the outcome of all attempted field visits in the ***'Field Visit'*** layer (See Table 1 for possible sample status and point outcomes). Any rejected points need to be replaced by oversample points until the desired sample size is met – see 'evaluation and sampling order' design concept. Detailed information on Field evaluation is covered in Section 3.2 of the Field Protocol and detailed information on data management during field evaluation can be found in the Data Management Protocol.

6. Finalizing Eval Status

A. Overview:

Project leads are responsible for ensuring the accuracy and completeness of all point statuses at the end of the season and contacting the National AIM Team when complete. However, the project lead, crew lead, or crew manager (depending on Roles and Responsibilities of your specific project) should iteratively update this information throughout the season not just at the end of the season.

Responsible parties: Crew managers (final review), crew leads (ongoing review), Project Leads (final approval)

Tools: Office Evaluation Webmap

B. Finalize *'EvalStatus'* for all sampled plots.

a. All data from sampled plots should be reviewed by Project Leads or Crew Managers, following the QAQC checklist found in the Riparian and Wetland AIM Data Management Protocol.
b. Once data has been reviewed, *'EvalStatus'* may be updated from "Sampled – Waiting for data review" to "Sampled – Data reviewed". These plots do not require further review except to consider ongoing data edits.

C. Finalize *'EvalStatus'* for all plots "Not Sampled".

1. All rejected plots marked "Rejected – Waiting for project manager review" must be reviewed by Project Leads or Crew managers.
   a. For sites rejected from the office, review *'RejectedReason1'* and *'RejectedReason2'*. Review all evaluation notes alongside imagery to determine whether the plot could ever be sampled in the future.
   b. For sites rejected in the field, review photos in the Data Review dashboard alongside data from Site Evaluation.

2. If it seems the crew made the wrong determination on the *'EvalStatus'* or the *'NotSampledReason',* decide whether the plot should be reattempted, or whether another *'NotSampledReason'* is more appropriate.
    a. If the plot should be reattempted:
        i. Change the *'EvalStatus'* to "Reattempt" and change the *'NotSampledReason'* to a reattempt option. Communicate with the crew how they should sample if there is time left in the season. Ex. If a crew marked a site as permanently inaccessible but the project lead identified another potential route.
        i. If the *'NotSampledReason'* should be changed: Identify the correct '*NotSampledReason'*.
3. There may be multiple overlapping reasons to reject a site, but "Non-Target" reasons are prioritized over "Inaccessible" reasons. Within "Non-Target" reasons, the order shown in Table 1 demonstrates the hierarchy.
    a. Example 1: A site was marked as "Permanently Inaccessible" by the crew, but imagery shows no perennial vegetation. This site should be updated in the ***'Plots'*** layer to "Non-Target – No perennial vegetation". Non-target points do not count as holes in the design, so this reason is preferred.
    b. Example 2: A site was marked as "Non-target – Size", but the small wetland area is exclusively covered by annual species. Change the status to "Non-target – No perennial vegetation".
        i. Make notes in the *'OfficeEvalComments'* field to explain why the *'EvalStatus'* and/or '*NotSampledReason*' was changed.
4. If there is agreement on the *'EvalStatus'* and *'NotSampledReason'*, update the *'EvalStatus'* to "Rejected – Project manager approved".
5. Assess progress made towards sample size goals and ensure the number of holes stays to a minimum.
    a. Manage the design such that each stratum will have fewer than 30% holes at the end of the season (see 'Holes in the design' in the design concepts section). If you find that you will likely have more than 30% holes at the end of the season, carefully review all 'inaccessible' points to determine which points might be feasible to reattempt. If possible, reattempt and sample some of these points. If this is not possible, consider increasing your sample size in this stratum to reduce the ratio of 'holes' to sampled points. If you need additional guidance, contact the National AIM Team.

D. Additional steps to finalize *'EvalStatus'* at project closeout:

1. Ensure all ***'Plots'*** have an *'EvalStatus'* appropriate to their level of review. By the time all data has been finalized:
    a. There should not be any plots marked "Sampled – Waiting for data review".
    b. There should not be any plots marked "Rejected – Waiting for project manager approval".
    c. Plots that have been office evaluated but not rejected or field visited should be marked as "Ready to Field Visit". This will indicate to the National AIM Team that the Office Evaluation information entered by the evaluator should be preserved for future reference. Please ensure 'OfficeEvaluationDate' and 'OfficeEvaluator' field

are filled in, and any important notes from the evaluation process are preserved in the 'OfficeEvalComments' field.

d. Plots that have been field visited but not rejected or sampled should be marked "Reattempt". Make sure an appropriate *'NotSampledReason'* is selected.
e. Unevaluated plots may remain as their original *'EvalStatus'*. This should only apply to oversample plots.
f. All Plots marked as "Base" in the panel field should have been evaluated and if not sampled, marked with an appropriate *'NotSampledReason'*. This also applies to all oversample points that fall prior to the last sampled plot in the strata.
    i. All plots prior to the final sampled plot in a stratum marked as "Reattempt" or "Permanently inaccessible" will be considered holes in the design.
    ii. Discuss these plots with the National AIM Team during project close-out.

2. For all Rejected and Reattempt plots, make sure the correct *'NotSampledReason'* is selected and that notes on rejections are thorough and accurate.
3. Review and clean up all comments so they are clear and make sense to people that were not involved in this year's process.
4. Review 'Check-In and Project Close Out' section of the data management protocol to ensure all data requirements have been met.

7. Glossary of Design Concepts

AIM Desk Guide | Bureau of Land Management : Guide for all AIM practitioners to develop and implement the AIM Strategy with additional guidance and workflows.

AIM Strategy: The AIM Strategy addresses renewable resource data collection specific to vegetation, associated habitats for wildlife, and the supporting ecological components of soil and water. In general, the strategy is intended to: (1) document the distribution and abundance of natural resources on public lands; (2) determine resource conditions; and (3) identify natural resource trend or change. (Toevs et al 2011).

Analysis: The process of turning data into information to answer a question.

Base Points: The original set of points in a panel of a design which are intended to be sampled in a given year.

Benchmark: An indicator value, or range of values, that establishes desired condition and is useful for management. Benchmarks are used to compare observed indicator values to desired conditions. Benchmarks for a given indicator may vary by potential, thus different benchmark groups may be necessary within a project area so that points are understood as meeting or not meeting an objective relative to potential.

Benchmark Group: A geographic area or group of monitoring points that have the same benchmark for evaluating the success of a particular monitoring objective. For example, if there are points across the entire field office but evaluating sage-grouse habitat is the objective, only the points that are within sage-grouse habitat should be considered for that objective. Likewise, the ecoregion, ecological site, the evaluation area, or stream type must be considered for determining whether an objective is met when benchmarks vary by ecoregion or ESD.

Condition: The status of a resource in comparison with a specific indicator reference value or benchmark (adapted from BLM Rangeland Resource Assessment-2011). When describing condition, a condition category may be assigned (e.g., Suitable, Marginal, Unsuitable or Minimal, Moderate, or Major departure) relative to the benchmark or reference value.

Confidence Interval: Range of values that likely includes the true value of a population mean. Confidence intervals help understand uncertainty in indicator estimates. The confidence level indicates the probability that the confidence interval includes the true value and is chosen by the monitoring data user. For example, an 80% confidence level indicates that 80% of sampling events will result in estimates that fall within this range; 20% will not (Elzinga et al. 1998).

Evaluation Status: Categorization of a potential monitoring point identified in a monitoring design. The evaluation status of the point has implications for how points are used in analyses and the subsequent inference to reporting units. Points are designated as either sampled or not sampled. Not sampled sites should be given a reason such as non-target, inaccessible, and reattempt needed. Additional and more specific categories are described in the Terrestrial Data Management Protocol and the Lotic and Riparian and Wetland Field Protocols.

Indicator: A component of a system whose characteristics (e.g., presence or absence, quantity, distribution) are used as an index of an attribute (e.g., biotic integrity) that is too difficult, inconvenient, or expensive to measure.

Management Goal: Broad goals or desired outcomes land managers are trying to achieve with land management. Management goals provide the context for why monitoring information is needed and how it will be used. Often, these are derived from planning documents and policy. Examples include maintaining forage production for livestock or high-quality habitat for wildlife.

Mdcaty (multidensity category): Method of adjusting weights in a random sample design so as to change the probability of picking a point from a particular class of points. Unlike strata, this process is more flexible.

Monitoring Design Worksheet (MDW): A step-by-step template to document and plan an AIM monitoring effort. This worksheet serves many purposes including documenting decisions and reasons for completing monitoring, providing the necessary information for drawing sample points, and completing analyses once data are collected. The MDW is an important reference document used during and after the completion of each monitoring project.

Monitoring Objective: Quantitative statements that provide a means of evaluating whether management goals were achieved. Monitoring objectives should include: 1. indicator; 2. benchmark for the indicator; 3. a time frame for evaluating the indicator, and 4. the reporting unit(s).

Oversample Points: Extra sample points which are selected at the time of the base sample draw. These points are used to supplement the base points when a base point is rejected or not sampled (see Evaluation Status). These are points to account for failures/rejections of base points to ensure we meet sample sizes.

'Plots' Layer: Arc GIS Online Feature Layer that, for each plot in each design, contains coordinates, design, and project information required for office and field plot evaluation. Used to view all plots in a design for a given year and track progress towards completing planned sampling.

***'PriorityOrder'*:** For random points, a sequential number in the Plots layer starting at one and ending with the total number of points within that stratum of the design. For targeted sites, numbers 1and 2 are used to indicate the priority of the plot according to the project lead, with 1

being used for base targeted sites and 2 for oversample (backup) targeted sites. The number is used to assist with assessing the order in which points should be evaluated and sampled.

Project: A unit of monitoring implementation for which specific monitoring goals are outlined and sample designs are created in alignment with those goals. Projects may be initiated at the district or field office scale. For each project, one or more project leads define the target population, sampling approach, stratification, sample sizes, and the monitoring methods to be used using a Monitoring Design Worksheet. Information about projects implemented during the field season can be seen in the 'ProjectInformation' table in the Office Evaluation Webmap.

Random design: Randomly selected sample locations used to collect measurements and estimates of condition within a study area where every member of the target population has a known probability of being selected. Results from random sample designs can be extrapolated to provide a statistically valid assessment of condition and trends across an entire population, or study area, with known levels of precision and accuracy (Gitzen et al. 2012). Random sample designs can be simple, stratified, and/or spatially balanced to ensure geographic spread across a sampling area (Stevens and Olsen 2004). See relevant reference documents for implementing landscape-scale or population-scale random sample designs (e.g., BLM 2015, Herrick et al. 2009). Random sample designs can also be used to provide context for nonrandomly selected targeted sites. See also Sample Design and Spatially Balanced Random Design.

Reporting Unit: A subset of the study area where information, such as indicator means and confidence intervals, is needed. A study area can have various reporting units. Reporting units may be different than stratification. Knowing the units ahead of time helps ensure adequate sampling. Watersheds, allotments, and GRSG habitat units are all examples of reporting units.

Sample design: A framework, or road map, that serves as the basis for the selection of sample plots and affects many other important aspects of a project as well. Provides information on the target population, sample sizes, strata definitions, time period over which data will be collected and the sample selection methodology. This term can be used interchangeably with 'sample plan,' 'survey design,' 'sampling plan,' 'sampling design,' 'monitoring design,' and 'study design.'

Sample Frame: A representation of the target population that is often a geospatial feature (e.g., SMA layer, NHD, wetland mapping). If a geospatial layer is not available, the sample frame can be a described using a list of the elements of interest we want to explore through a sample survey.

Sample Point (Reach or Plot): Location where monitoring information has been collected or data collection is planned. For Terrestrial and Riparian & Wetland AIM, this is a plot. For Lotic AIM, this is a stream reach. In some documents, the term sample point is used to refer to both.

Sample Size: The number of points or plots in the target population that need to be sampled within a stratum to ensure a desired level of precision and accuracy for data analysis. The sample size across the study area is a function of several factors: 1. existing or legacy monitoring information; 2. statistical considerations (e.g., what analyses are needed, what is the desired confidence level

and confidence interval); 3. funding and personnel limitations (e.g., how many points per year can be accomplished). The sample size may influence the types of analyses that can be performed and the confidence level of the results.

Sampling: Using selected members to estimate attributes of a larger population.

Sampled Population: The portion of the target population that was actually sampled.

Strata: In the context of monitoring, stratification refers to dividing a population or study area into sub-groups or subunits called strata for the purposes of sampling or data analysis. Strata can be used to ensure adequate sample sizes for parts of the study area of management concern or may be used to increase precision when extrapolating data over large areas. Example reasons to stratify include: 1) ensuring a sufficient sample size in reporting units; 2) ensuring uncommon portions of a study area are sampled; and 3) placing sample points in homogeneous groups to account for natural environmental gradients (BLM AIM 2017). Examples of possible strata for Riparian and Wetland systems are: field offices, management or planning units, or endangered species habitat boundaries. Strata are defined at the design stage and have important implications on the order in which plots are sampled. Once strata are run in a design, they cannot be modified in the design without a re-run. They should be considered mainly for permanent boundaries based on reporting units unless there is very strong evidence to use them.

Stratification: Stratification refers to dividing a population or study area up into sub-groups or subunits called strata for the purposes of sampling or data analysis. Reasons to stratify: 1. variability in indicators is different across strata; 2. ensure features of interest (e.g., habitats); especially uncommon ones, within the study area are adequately represented in the sample population. Examples of strata include biophysical settings (BpS), stream order (Strahler stream order), management unit boundary, and ecological sites. Strata should have a strong correspondence to conditions on the ground. Serious analysis problems arise when boundaries for strata do not reflect sampled conditions, ie a “forested” point is actually majority herbaceous cover . Use of strata should be judicious especially in wetland designs. If an mdcaty can be used to increase the sampling probability of a population of interest, that is preferred.

Study Area: (a.k.a. Project Area). Defines the extent of the population and is the maximum area to draw conclusions about.

Targeted Design: A collection of hand-selected points submitted by the project lead for AIM data collection. Points will be submitted via the Targeted Site Submission Form.

Target Population: The target population for a survey is the entire set of sample units (e.g., Wetland and Riparian plots) for which the sample design is to be used to make inference. Thus, the target population explicitly defines those units for which the findings of the survey are meant to generalize. Sample points in the design are selected from within the population. The definition of the target population should contain specific information on the resource of interest, its spatial extent, its ownership status, its size. The definition should be specific enough that an individual

could determine whether a sample point is part of the target population. Examples of the target population include: all riparian and wetland ecosystems within a reporting unit or all wetlands in sage grouse habitat on managed lands (Monitoring Resources, 2017).

Targeted Sample Points: Sample locations that are manually selected with the judgement of the project manager to ensure data is collected to estimate condition and trends at nonrandom sites. These sites are usually selected to address specific management goals such as document a reference condition, establish a repeat monitoring area, monitor known habitat of a rare plant or animal species, or track changes that result from management actions like grazing or restoration (e.g., critical designated monitoring area) (Burton et al. 2011). For targeted sample points, statistical inference cannot be drawn beyond the sample area.

Targeted Site Submission Form: Web map accessed through BLM AIM Riparian and Wetland AGOL group for adding targeted points to map and any site potential boundaries associated with the point.

Weight: A weight is the area (in acres or hectares) or length (in stream kilometers) represented by each plot. For an unstratified sample design, all plots have the same weight, equal to the extent of the sample area divided by the number of plots. For a stratified sample design, plot weights are calculated for each stratum, as the extent of that stratum divided by the number of plots in it. Plot weights are used to convert from plot-based estimates to area-based estimates. As an example, imagine an aquatic AIM sample design in which stratum A has 100 km & 25 plots; stratum B has 25 km & 25 plots. Each plot in stratum A has weight = 4; in stratum B, weight = 1. If average bank stability is 80% in stratum A and 40% in stratum B, an unweighted average across plots is 60%. A weighted average accounts for the different spatial extents of the strata: (4×80% + 1×40%)/5 = 72%. This is the simplest case, in more complicated cases we may need to consider multiple sample designs, reporting units in which the proportional extents represented by the strata differ from those of the sample design, and how sample designs were implemented (see Evaluation Status).

Appendix 1. Office Evaluation Webmap Quick Start Guide

The office evalution webmap has the information needed to conduct office evaluations. The goal is to populate the *'EvalStatus'* field with the correct evaluation status. If the site is rejected, the appropriate 'NotSampledReason' must be selected. This is very important to prevent holes in the design. In 2025 we will be switching to the new map viewer which has a different style and location of the buttons. Get started with Map Viewer—ArcGIS Online Help | Documentation will help orient yourself to the new map viewer.

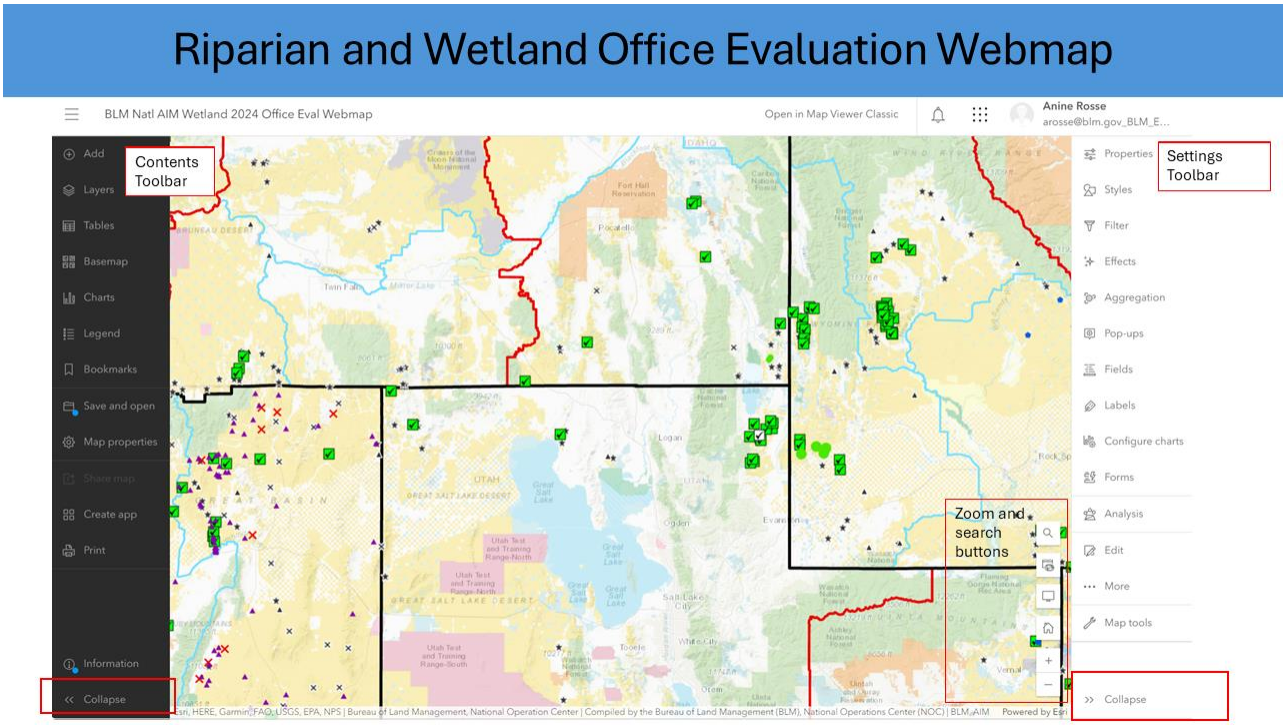


Figure 2. Riparian and wetland AIM Office Evaluation Webmap overview with the map in the center, contents toolbar on the left and settings toolbar on the right.

The information in the map is in the left panel, the Contents Toolbar. The Settings for the information in the map can be adjusted on the right side in the settings toolbar. The zoom and search buttons are in the lower right-hand corner of the map and the expand/collapse tabs are at the bottom of each toolbar. If the toolbar is not visible, click the expand arrows at the bottom of the toolbar.

To view the layers in the map, go to the contents tab on the left side, on the contents toolbar and click the ***'Layers'*** button.

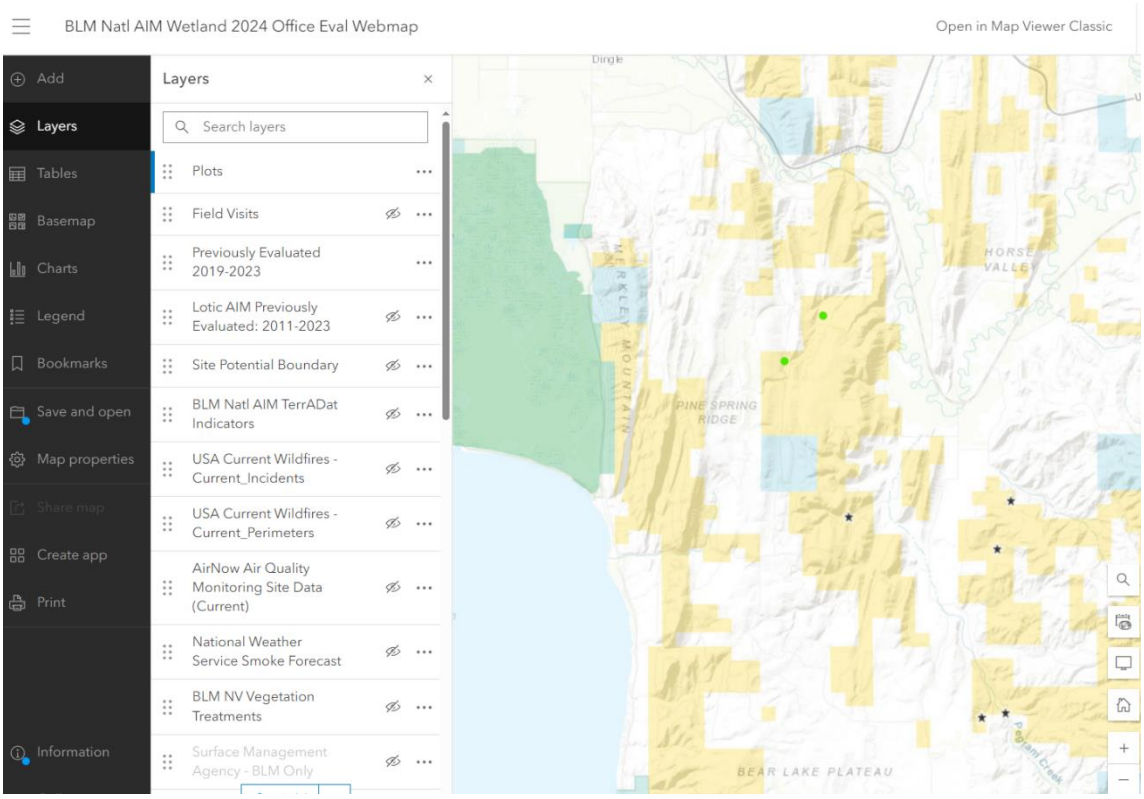


Figure 3. Riparian and Wetland AIM Office Evaluation Webmap layers on the content toolbar to view layers.

Once the content toolbar is open, you can view the layers in the map. One can click and drag to change the order of the layer visibility. Also, you can toggle on and off the visibility of each layer by hovering over the eye. Finally the 3 dots on the far right give one the 'Options' group to show the table, etc.

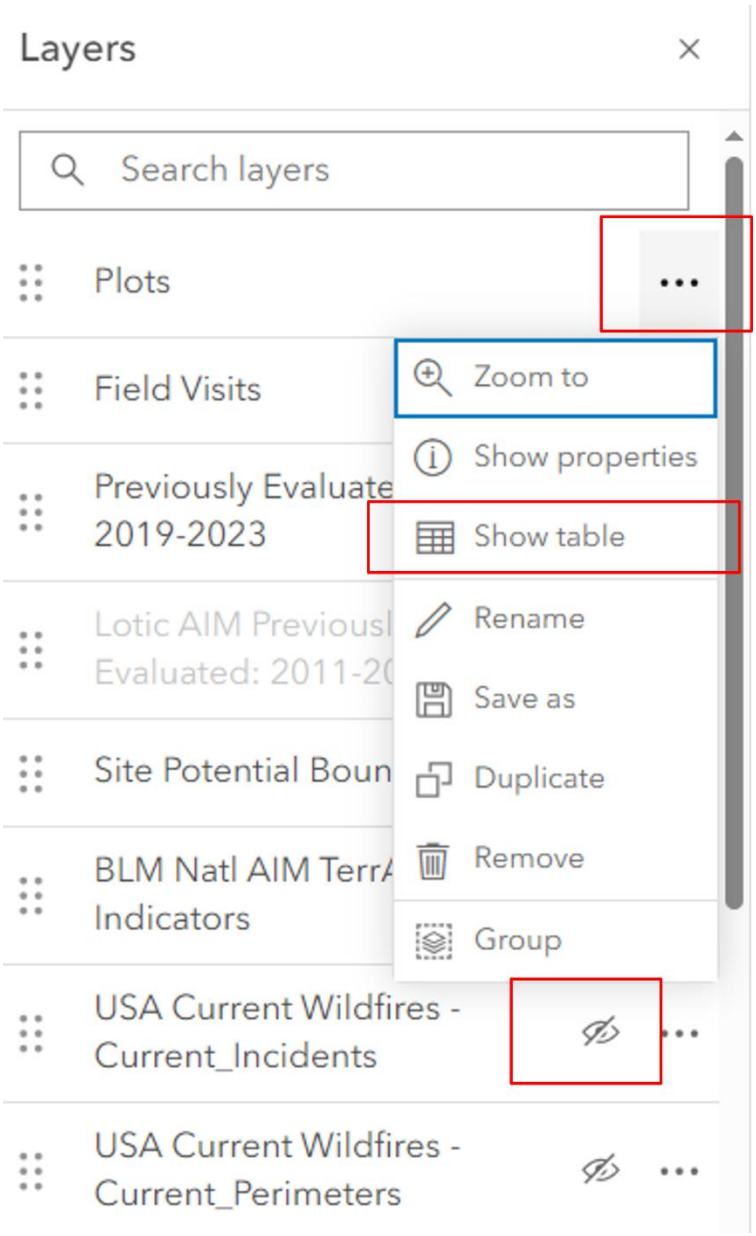


Figure 4. Riparian and Wetland AIM Office Evaluation Webmap accessing options for* 'Plots' *layer. The crossed out eye icon further down on the list of layers, 'USA Current Wildfires-Current_Incidents', ***shows it is not visible in the map.***

The legend for the layers can be accessed by clicking on the ‘legend’ heading in the ‘Contents’ toolbar.

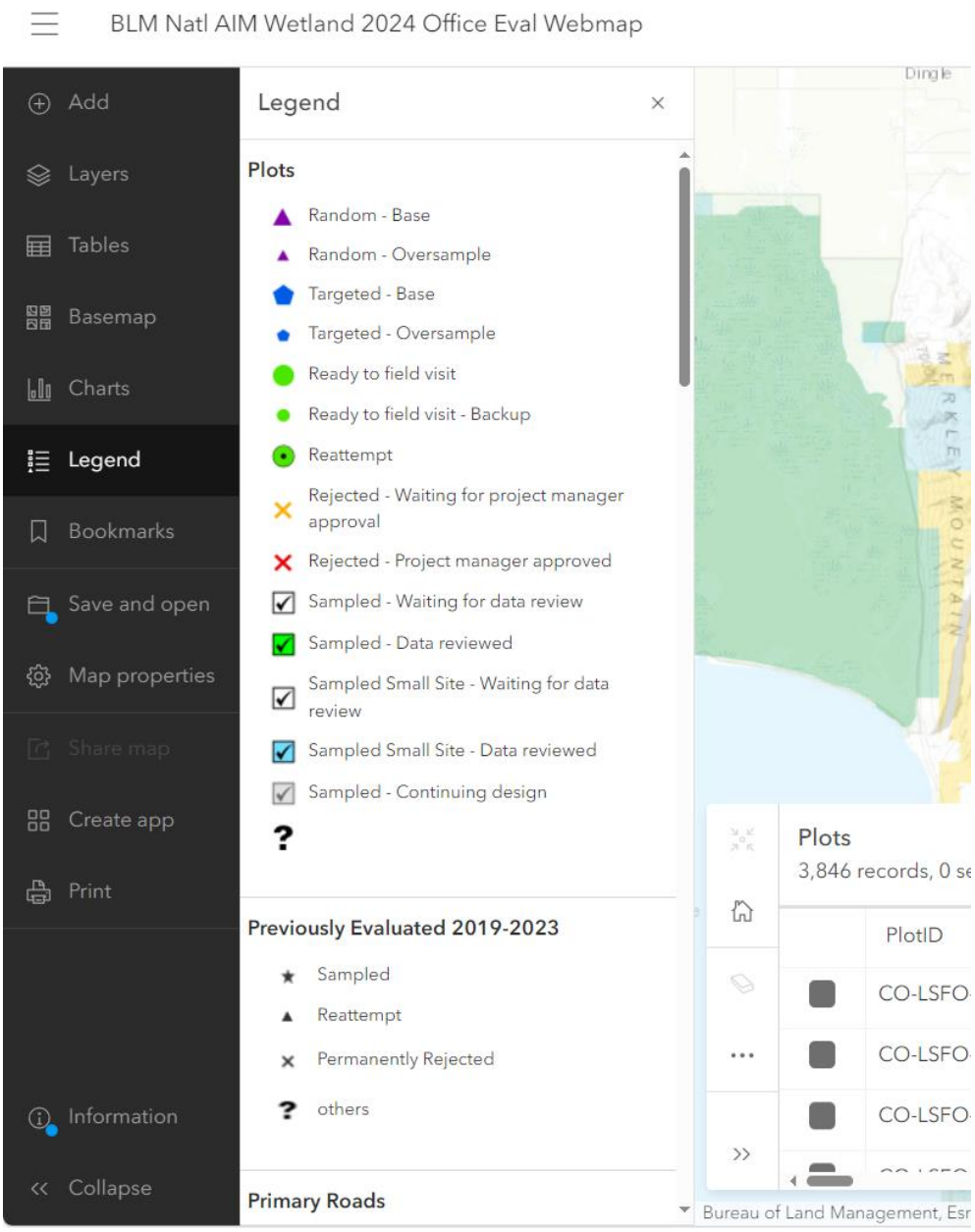


Figure 5. Accessing the Riparian and Wetland AIM Office Evaluation Webmap legend for the active layers.

The Basemap can be accessed from the ‘Basemap’ listing on the ‘Contents’ toolbar.

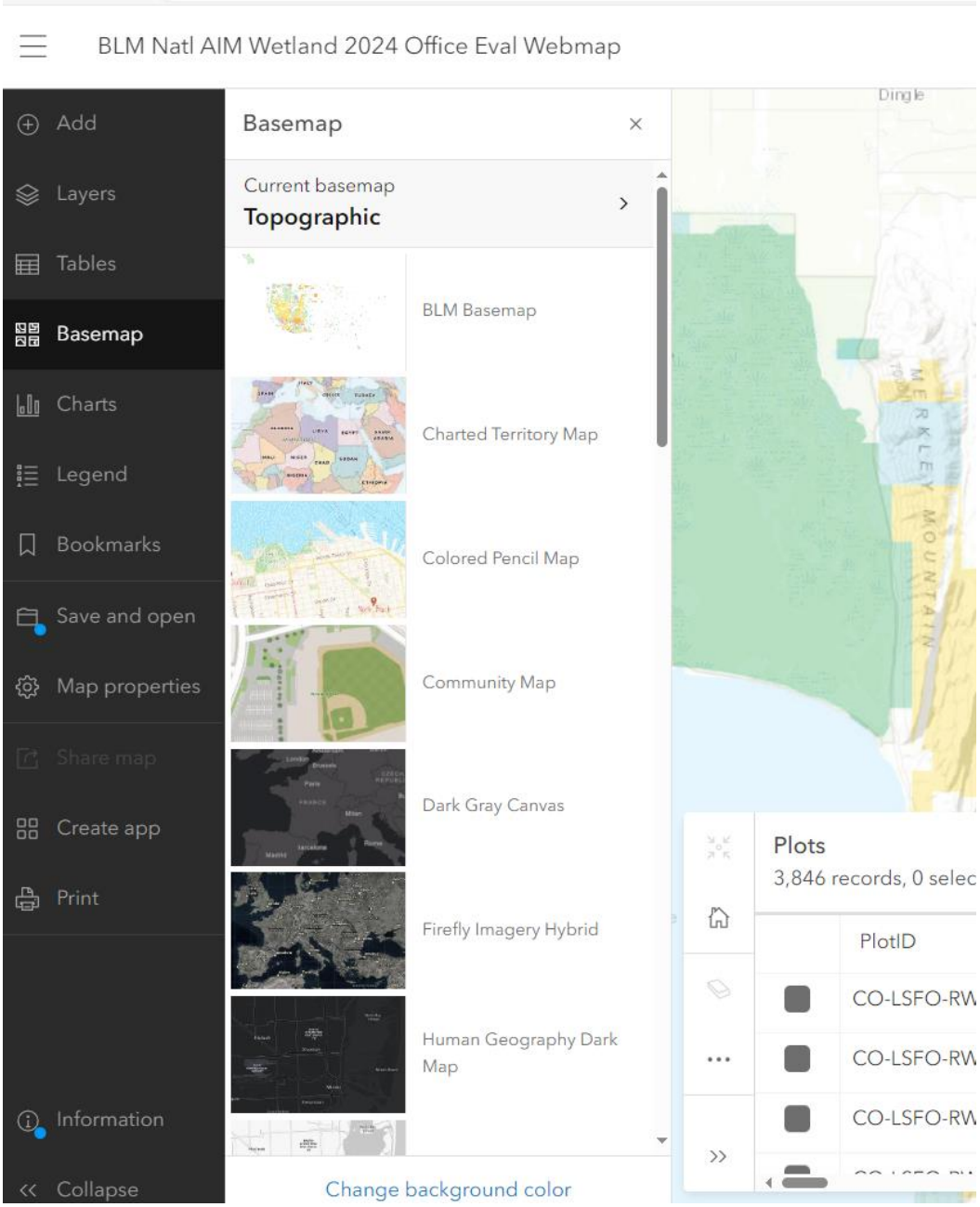


Figure 6. Accessing the Riparian and Wetland AIM Office Evaluation Webmap basemap.

Properties, filter, and edit are commonly accessed from the right, on the Settings panel. To look at properties of a layer, the panel on the left shows you that ‘Plots’ is active from the ‘Layers’ Dropdown. The active layer will appear at the top of whatever setting you are looking at. Then one can scroll and change properties on the right panel.

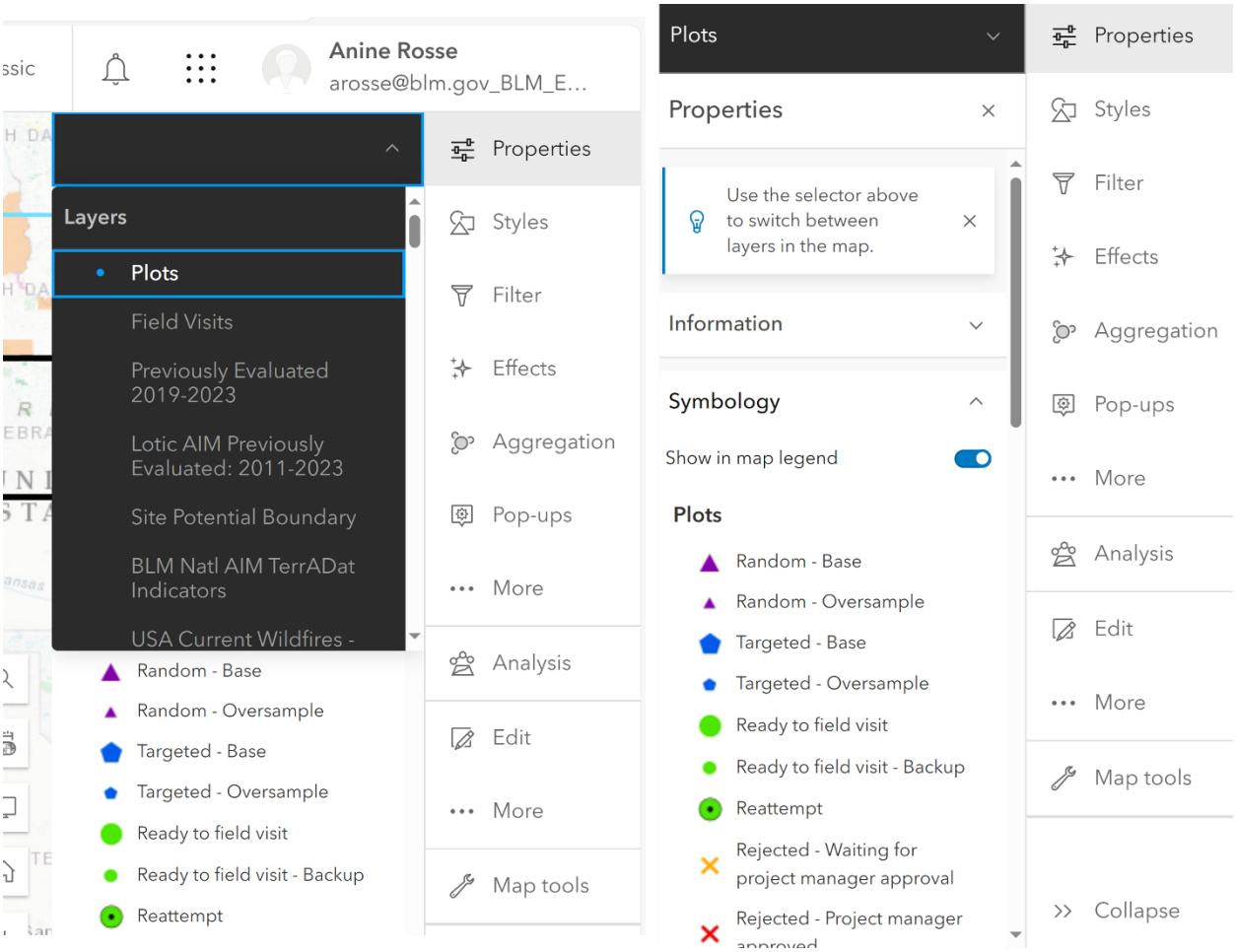


Figure 7. Accessing Layer Properties.

‘Filter’ is a tool to restrict the data in view with a condition or conditions. Filters are temporary and can be deleted when no longer needed. Conditions can be changed in the drop-down. Be sure to hit ‘save’ to save the condition. Multiple conditions can be added either by clicking ‘Add new’ or hitting the three dots on the right and adding condition there. Be sure to remove conditions when assessing the project as a whole to ensure data are complete.

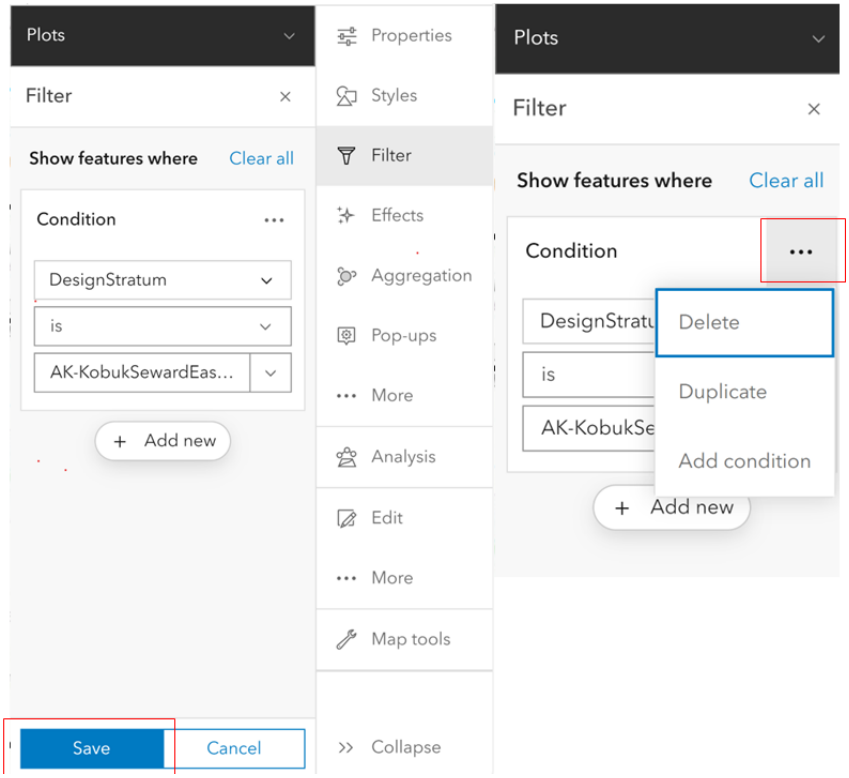


Figure 8. Accessing and using the filter.

When ready to edit a point and perform an office evaluation, the best way is to use the editing form provided. First, one should zoom in on the map and simply click on a point to open the same editing table for that point.

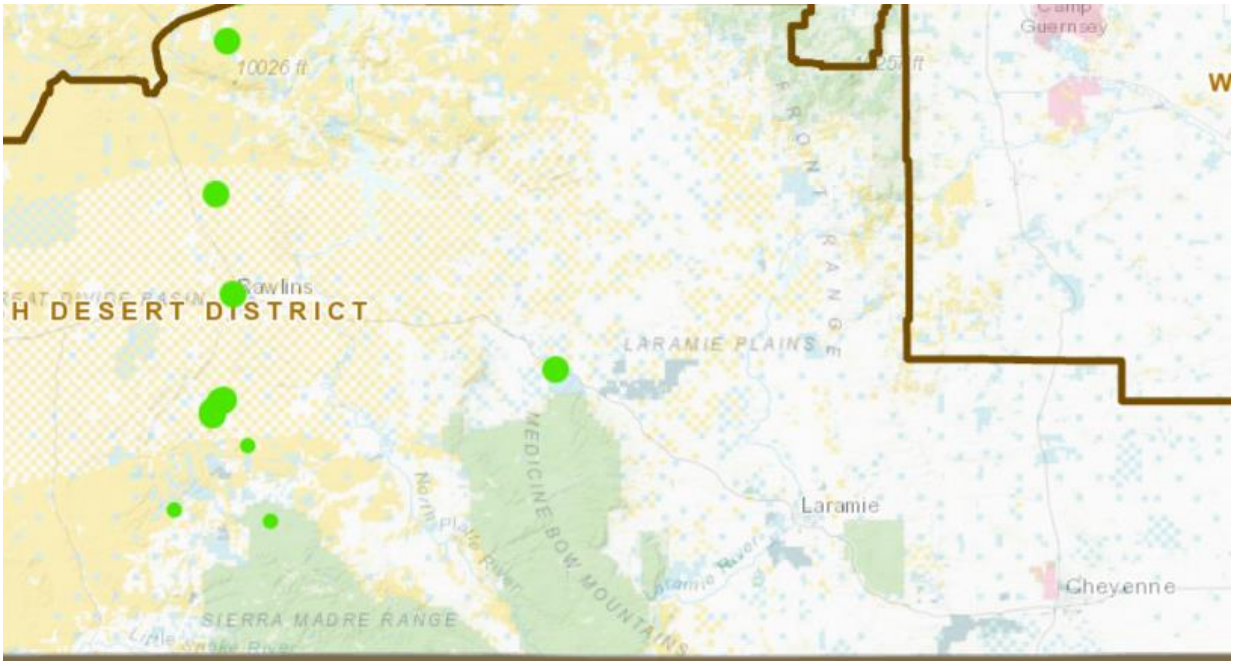


Figure 9. Zooming into the map to select a point for office evaluation.

The table opens as shown in Figure 10.

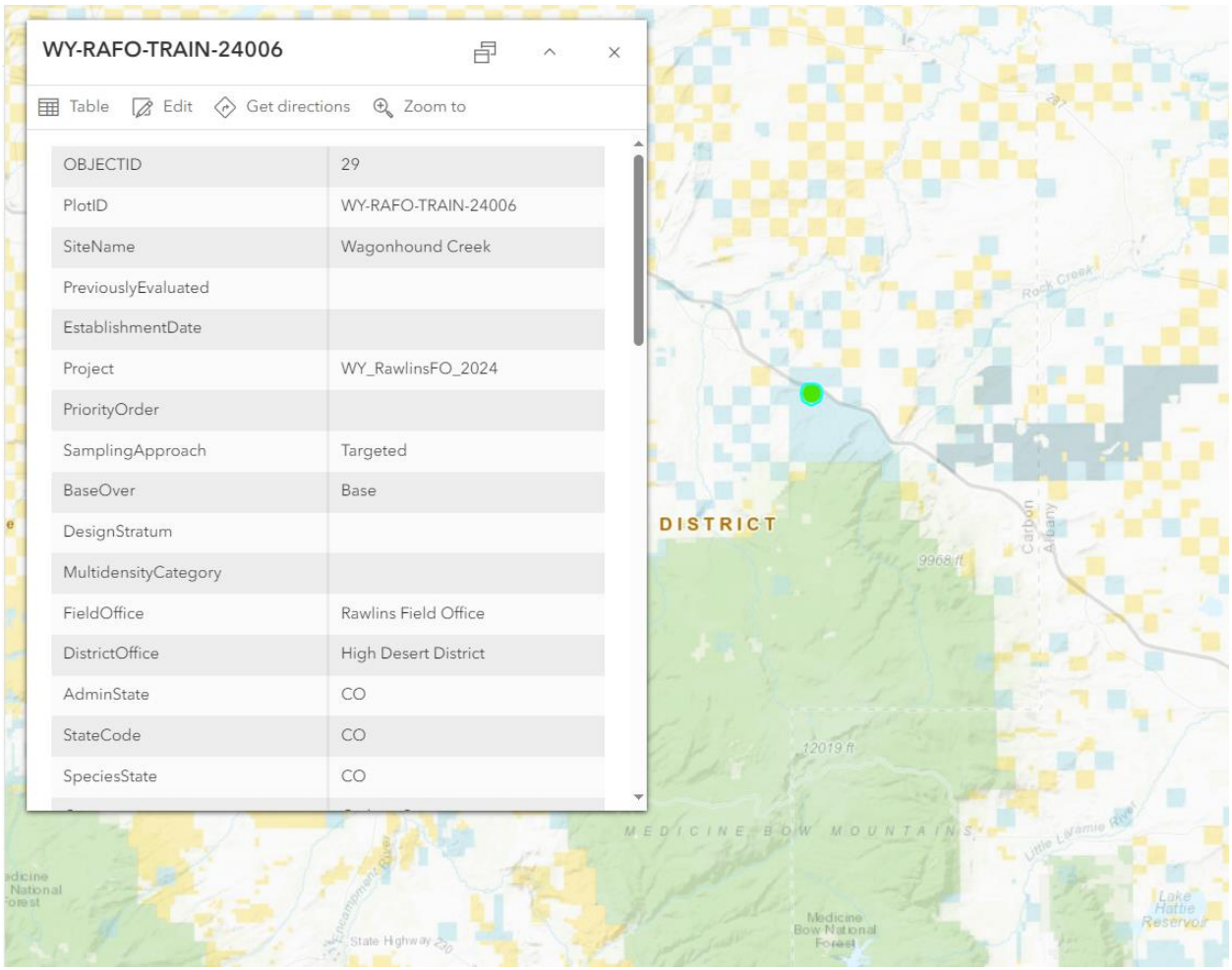


Figure 10. Table for selected point opens.

Click the ‘edit’ button on the table popup, and the editing form will appear on the right.

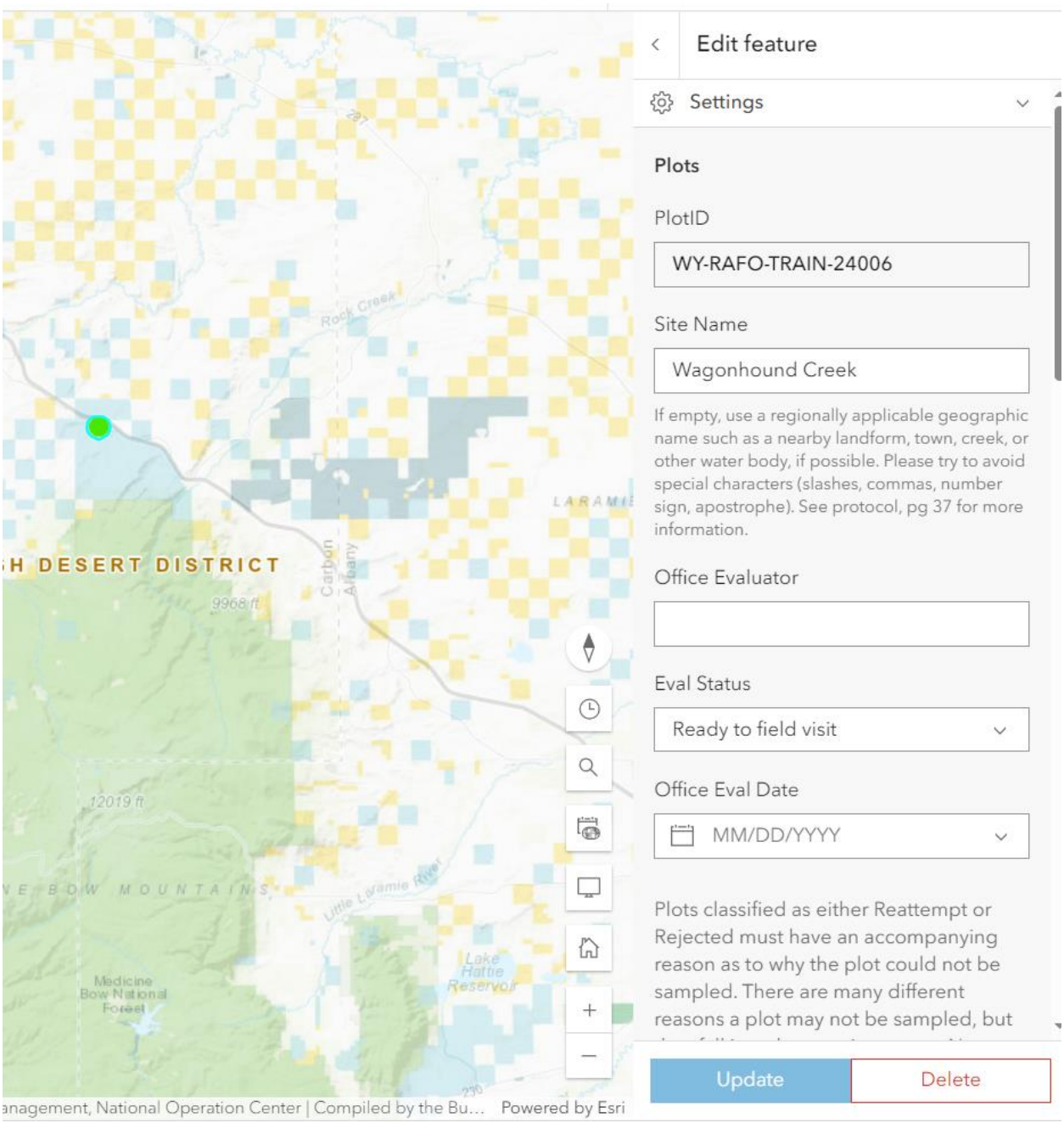


Figure 11. Edit feature form.

This is where one should enter all the relevant information for an office evaluation. One does not have to enter all the information at once, but instead fill out fields, then click update at the bottom of the form. If one desires to exit the form without saving, using the 'back' button to return to the 'editor' toolbar and then click on the 'edit' icon again to exit the 'edit'.Do not use the delete button. That will delete the point.

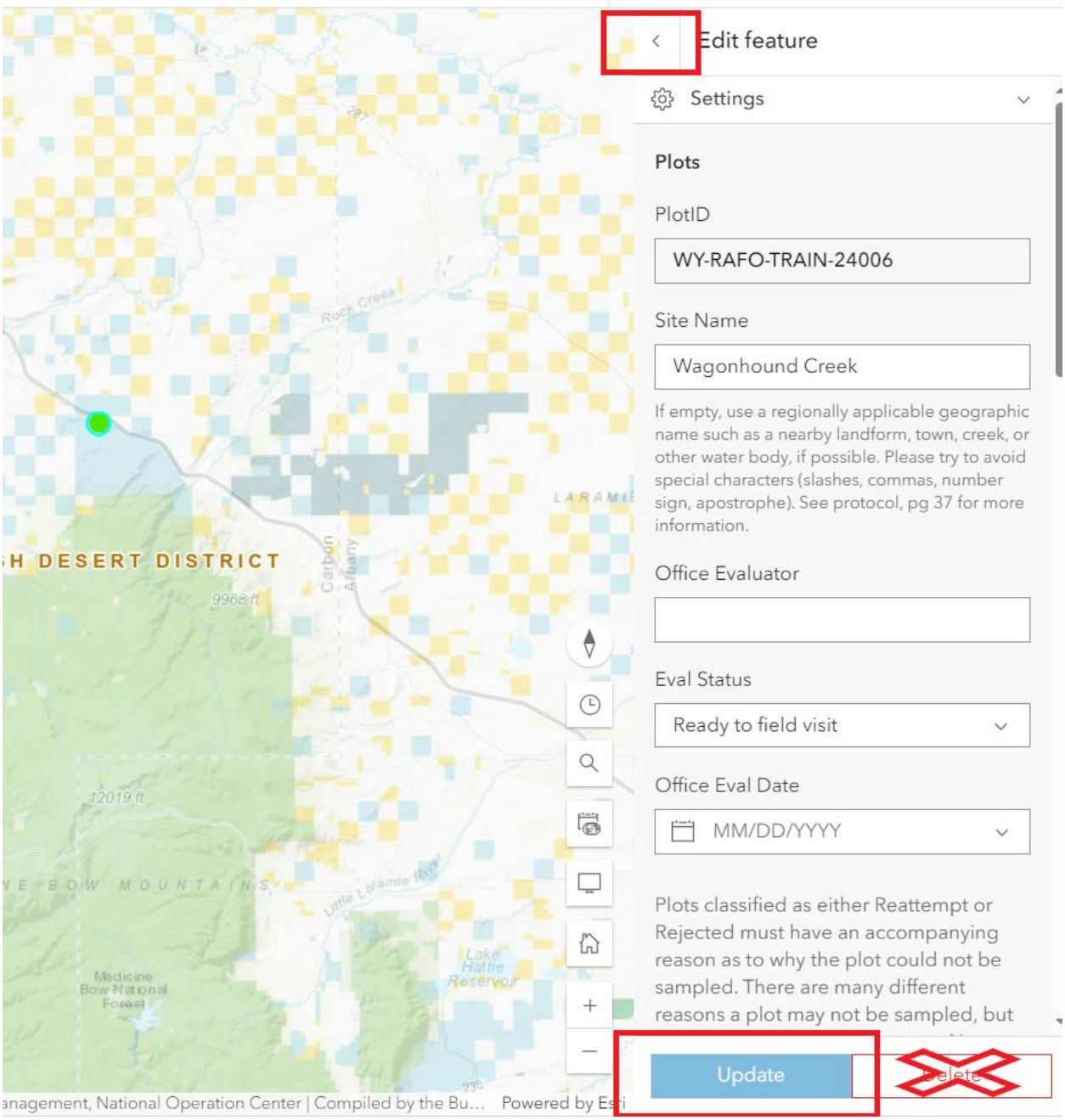


Figure 12. Edit feature form navigation- use the back button at the top to save without edits, do not use the 'delete' button. Use 'Update' to save.

One can also edit by accessing the table for editing, click on 'Show Table'. This opens the 'Plots' table. The pencil to the right of the table allows one to edit. Be sure to click 'update' at the bottom to save changes. Click the 'back' button at the top of the edit box if you wish to escape without making an edit.

Lastly directly using the ‘Edit’ in the settings toolbar should **not be used. It is for creating features on the map rather than data in the table.**

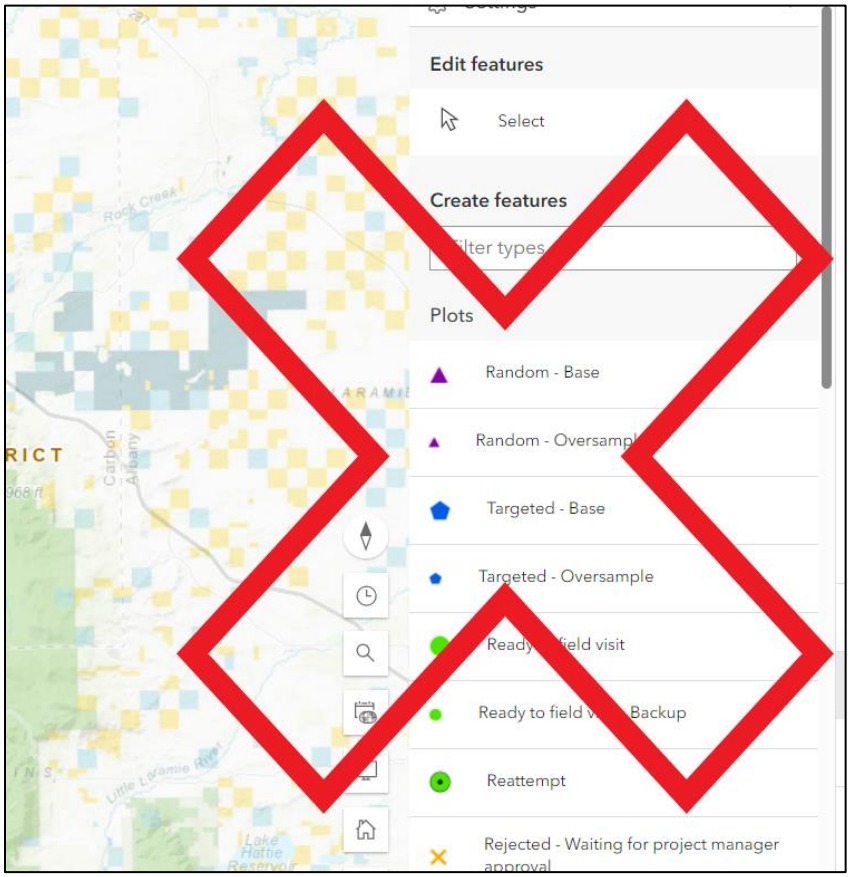


Figure 13. Don’t use this ‘Edit’ tool in the Settings Toolbar.

Appendix 2. Office Evaluation Webmap Metadata

Table 2. Plots layer field metadata. Blue indicates the field is prepopulated. Red indicates a field that may be prepopulated, but may be edited by BLM field office staff. Green indicates fields that may be edited by crew managers or crew leads.

Plots Layer Field	Who's responsible	Description
PlotID	NOC	Alpha-numeric code assigned by the NOC. Code represents a two letter state followed by a field office or district office code, followed by a code for sampling approach, followed by a 5-digit number starting with a 2-digit code for draw year. The remaining 3-digits of the number are coded - targeted sites are in the range [0-499] while random sites are in the range [500-999]. Thus, 24080 is a 2024 draw year and 80 is the draw order. Used to relate all data associated with that monitoring location.
SiteName	Project lead	First pass on naming sites is from BLM project leads, but empty site names may be filled in by Crew managers or leads based on helpful geographical landmarks or place names.
PreviouslyEvaluated	NOC	No, Previously Sampled, Previously Rejected, Previously Reattempt, or Previously NotEval. This field shows whether a given PlotID has been evaluated during a previous field season. More information on the previous sampling event can be found in the Previously Evaluated layer of the webmap.
EstablishmentDate	Project lead Crew manager Crew lead	Date of first visit. Filled in by NOC if point has been sampled before. Otherwise filled in by Crew Lead during field season.
Project	NOC	Name representing project. For 2024 sampling, project is by state. Crew leads should use this information to filter the Office eval map for the points in their state.
PriorityOrder	NOC	Numeric representation of priority. For random sites, this represents the draw order within a particular stratum. This order number will indicate the order in which points should be evaluated. If a base sample is rejected, then the oversample with the lowest order number should be evaluated next. For targeted sites, priority is indicated by project leads, with 1 = Base points to be sampled this year and 2 = Oversample, good as backup options.
SamplingApproach	NOC	Random or Targeted.
BaseOver	NOC	Indicates whether the point originates as a Base (primary) point or as an Oversasmple (backup) point. b
DesignStratum	NOC	The design name + stratum used during the draw of random points ("None" or NA for targeted sites). An example stratum was defined in some random designs by ecoregion.

MultidensityCategory	NOC	Used for some random sites during sample draw ("None" for random sites, "None" for random draws with no multidensity categories defined). These categories are used to draw plots, but should not be used to select replacement sites from list of Oversample.
FieldOffice	NOC	Administrative field office of the BLM.
DistrictOffice	NOC	Administrative district office of the BLM.
AdminState	NOC	Administrative state office of the BLM.
SpeciesState	NOC	State species list to be used during sampling, corresponding to the political state.
StateCode	NOC	Political state.
County	NOC	US county name.
WetlandIndicatorRegion	NOC	Region used for defining wetland indicator status of plant species (i.e. Arid West, Mountains Valley and Coast, etc.).
LRR	NOC	Land Resource Region the plot is located in, used to select potential hydric soil indicators.
ElevationFt	NOC	Elevation (feet). This field should be used for trip planning purposes, while elevation in forms will be calculated in Survey123 in situ.
CowardinAttribute	NOC	Cowardin attribute code of site assigned by the National Wetlands Inventory for reference purposes. Most random sites will correspond to NWI polygons, but some targeted points may not be mapped in NWI as shown by "None". May not be included for non Palustrine systems.
Allotment	Project lead	May or may not be pushed into design from the NOC. Project leads particularly interested in allotment may enter this into their Targeted site list to push into points layer.
DesignLatitudeWGS84	NOC	Original latitude of the design sample location in WGS84 coordinate system.
DesignLongitudeWGS84	NOC	Original longitude of the design sample location in WGS84 coordinate system.
OfficeEvaluator	Crew manager Crew lead	First and last name of person doing office evaluation.
EvalStatus	Crew manager Crew lead	Used to track a point's status throughout the season from unevaluated to sampled and data reviewed. At the end of the season all sampled plots should have a status of “Sampled - Data reviewed” and all plots that have been rejected should have a status of “Rejected - project manager approved”.
OfficeEvalDate	Crew manager Crew lead	The date plot was office evaluated.
NotSampledReason	Crew manager Crew lead	Specifies the primary reason that a reach was not sampled (e.g., Nontarget, Permanently inaccessible, or Reattempt Needed (for temporary rejections in the field)).
RejectEvidence1	Crew manager Crew lead	The first line of evidence used to reject the point and classify in the appropriate ‘RejectedReason’ category (e.g., field visit, local knowledge, imagery, administrative boundaries)
RejectEvidence2	Crew manager Crew lead	The second line of evidence used to reject the point and classify in the appropriate ‘RejectedReason’ category (e.g., field visit, local knowledge, imagery…)

OfficeEvalComments	Crew manager Crew lead	General notes about the plot that may help with site evaluation. May include likely plant community, fire history, suggestions on sampling time or restrictions to access.
AccessNotes	Crew manager Crew lead	Detailed directions on how to get to a point from a major town or landmark: both driving and walking parts of the journey. Be complete and concise, note landmarks, permanent features, road names, land ownership issues, and segment distances. By the time a point is classified as "Ready to sample", these access notes should provide you with all the information you need to access the point in the field and can be copied into a directions field in the Plot Characterization form during sampling.
DistanceFromRoad	Crew manager Crew lead	Distance in miles to the nearest road or accessible two track as estimated by crew leads.
PlotLayoutComments	Crew manager Crew lead	General notes about likely plot layout to be used or plot dimensions to help with plot layout in the field
AdditionalGuidanceNeeded	Crew manager Crew lead	Used by crew leads to flag sites with needed follow-up. This field should be used as a way to track their notes for themselves before following up with project leads via email. BLM Project Leads will not know to check this field.
SampleTiming	Project lead	Originally may be filled in by project leads during the site submission process. Once office evaluation starts, office evaluators may use this field to arrange sampling.
Monumenting	Project lead	Filled in by project lead. Should be used to determine whether additional monumenting materials should be brought to the site. May be “Tablet GPS and photos”, “Wooden stake”, “Rebar with caps”, or “Fenceposts”. Materials for monumenting should be provided by project lead.
BLMComments	Project lead	Comments submitted during targeted site submission or notes added later by BLM DO/FO staff. May include recommended sampling time, recommended plot placement, management history information, access notes, or special considerations about sampling.
BLMContact	Project lead	Contact information of BLM personnel who submitted targeted points.
Hitch	Crew manager Crew lead	Hitch number
Hitch Notes	Crew manager Crew lead	Notes specific to the hitch for tracking by crew lead. May be used prior to sampling for hitch-specific reminders, then edited after sampling to include information on how sampling went.
CollectWQ	Project lead	Based on project task order, this Yes No field indicates whether Water Quality methods should be implemented, including in-situ measurements and grab samples.
CollectAnnualUse	Project lead	Based on project task order (random plots) or based on requests from BLM staff during site submission (targeted), this field indicates whether Annual Use methods should be applied. "YesContractCrew" indicates the crew is expected to complete annual use forms during normal sampling. "YesContractCrewSecondVisit" indicates the contract crew

		should return at another time to take Annual Use measurements. "YesBLMStaff" indicates BLM staff will return to take the annual use measurements themselves at a later date.
CollectHummocks	Project lead	Based on project task order, this Yes No field indicates whether Hummocks methods should be applied.
Supplementals	Project lead	This lists additional methods the contract crew is expected to complete. Crew managers and Project Leads should discuss method implementation prior to field visit.
Candidate Reference	NOC and Project Lead	Generally populated during the Targeted Site Submission process by the Project Lead and indicates whether the site should be considered a candidate for reference condition in ongoing work to understand the concept.

Table 3. Field descriptions for the Riparian and Wetland AIM Previously Evaluated layer in the Office Evaluation Webmap. In this layer, each record represents an evaluation for a given point. This layer can be used to inform office evaluation by providing information on reasons for past rejections and access instructions for previously visited plots. The geometry of each sampled point should show the plot center location of that field visit. All other field evaluations will be shown as the geographic location crews were able to reach to make their evaluation (i.e. the location of their Site Evaluation form). Office Evaluations show the location of the original sample location.

Previously Evaluated Layer Field	**Description**
EvaluationID	The unique visit ID used to identify and connect all data about a particular site visit. This field is blank for records that are only office evaluated.
PlotID	Alpha-numeric code assigned by the NOC. Code represents a two letter state followed by a field office or district office code, followed by a code for sampling approach, followed by a 5-digit number starting with a 2-digit code for draw year. The remaining 3-digits of the number are coded - targeted sites are in the range [0-499] while random sites are in the range [500-999]. Thus, 24080 is a 2024 draw year and 80 is the draw order. Used to relate all data associated with that monitoring location.
Project	Name representing project for which a particular point was evaluated.
AdminState	Administrative state office of the BLM.
SpeciesState	State species list to be used during sampling, corresponding to the political state.

EstablishmentDate	Date of first visit. Filled in by NOC if point has been sampled before. Otherwise filled in by Crew Lead during field season
FormDate	Date of site evaluation.
Observer	Observer of site evaluation, whether in the office or in the field.
SampleLocationAccessible	Whether or not the original sample location was physically accessible. [Yes, No]
LocationStatus	The evaluation status at the time of evaluation. [Sampled, Permanently Inaccessible, Non-target, Reattempt, Office Evaluated].
NotSampledReason	The reason for not sampling during a particular evaluation.
LocationVerificationComments	Comments by the field crew during sample visit on the plot's applicability for sampling. This will only be filled in for Field Evaluated plots.
AccessComments	Access directions. These directions come from the Site Evaluation form for Field Evaluated points and from the Plots layer for Office Evaluated points.
EvaluationLevel	The type of evaluation performed, either Office Evaluated for points that were never field visited, or Field Evaluated for points that were first office evaluated then field visited. This determines the source of the information about the evaluation.
OfficeEvalComments	Comments by the office evaluator on the plots applicability for sampling. This will only be filled in for Office Evaluated points.
OfficeRejectEvidence1	The first line of evidence used to reject the point and classify in the appropriate 'RejectedReason' category (e.g., field visit, local knowledge, imagery, administrative boundaries). This will only be filled in for Office Evaluated points. This comes from the Plots layer.
OfficeRejectEvidence2	The second line of evidence used to reject the point and classify in the appropriate 'RejectedReason' category (e.g., field visit, local knowledge, imagery, administrative boundaries). This will only be filled in for Office Evaluated points. This comes from the Plots layer.
EvalMethod	Which method was used to evaluate this point, whether Pilot RW, Standard RW, or Small Site Pilot.

Appendix 3. Special Instructions for Annual Use Revisits

Since 'Annual Use' revisits may be completed by BLM staff, the following guidance is created to highlight aspects of data collection which differ slightly from usual sampling methods. Ensure the following is clear prior to completing an annual use visit.

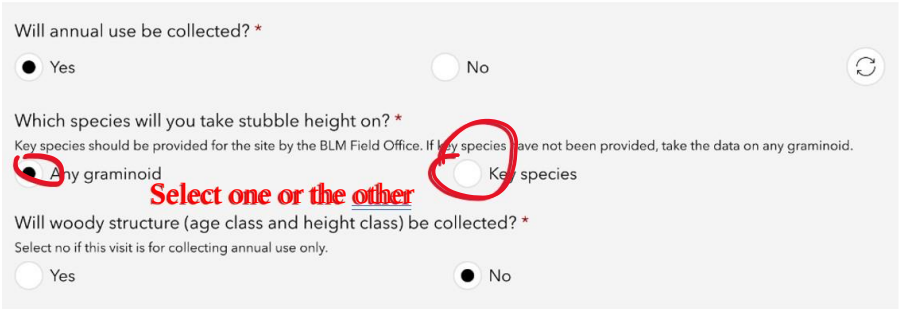
Technology – Complete and check before leaving service

A. In Field Maps app, you should download an offline area in field maps using the map called "BLM Natl AIM Wetland 202x Field Map (Revisits)"
B. This map will have GPS information for all forms launched during the original site visit as well as a couple layers showing the GPS of the end points of each transect, and lines connecting the beginning and the end. Use whichever layer is most helpful in placing transects.
    i. GPS locations for transects will not be totally accurate. iPads have an accuracy of around 6 m. So, when placing transects, you'll have to use a combination of photos and GPS and what you're seeing on the ground to get as accurate a placement as possible.
    ii. Look at the original field visit and comments to determine if monuments such as rebar have been placed to make the transect locations
    iii. The layer showing transect lines is no more accurate than using the points for beginning and end, so when comparing your transects on the ground to the map, you should be comparing the placement of start and end, not whether the line is going in the correct direction. For direction, you can see the Azimuth recorded if you click the transect points. This is another good way to check transect placement.
C. All the layers will be turned off except for Plots and Field Visits. To view transect and plot characterization information on the map, click the layer button in the top righthand corner. Then click the toggle buttons for the layers you would like to see.
D. While connected to WiFi, download necessary offline areas. Then double check the layers will show off WiFi prior to leaving service.
E. In Survey123, make sure all the necessary forms are downloaded.
    i. Necessary forms include:
        1. BLM Natl AIM Wetland 202x Woody Structure and Annual Use
        2. BLM Natl AIM Wetland 202x Photos
        3. BLM Natl AIM Wetland 202x Unknown Plants
    ii. If these forms do not show up in your forms, click the person icon in the upper righthand corner, then click "Download Surveys". Next search for "BLM Natl AIM Wetland" and all forms should show up. Select the download button to ensure they are all downloaded to your device.
F. Photos will be provided for revisits in the corresponding state folder of the AIM Riparian & Wetlands Field Work Team in Microsoft Teams. Contact Michelle Stropky (mstropky@blm.gov) if you do not have access to this Team.

G. Download these photos for offline use to help place transects in the field.
H. Plot drawings will also be provided when applicable. These also can provide information on where they dug the soil pit and took water samples.
I. It may also be helpful to download the georeferenced maps for the sites you are likely to visit. Each site has three georeferenced maps at different scales to help with navigation. These maps can be used in apps like Avenza or Paper Maps to aid in navigation.

Changes to data collection

J. For annual use visits, you will only need to launch a field visit from the original Plot point, and a Woody Structure and Annual Use form for each transect launched directly from that field visit. If you take photos, you may also launch a photos form to associate these directly with the field visit.
K. To start data collection, at each plot you should:
    i. Open Field maps, select the plot you are visiting, then scroll down in the information popup until you see a link to launch a field visit.
    ii. Select this link, and add a new feature, filling in necessary information.
        1. Plot information such as *'AdminState'* and *'Project'* will be listed in the original plot data. If you don't know what field should be in the ***'FieldVisits'*** layer, first refer back to information in the ***'Plots'*** layer.
        2. For *'FieldVisitType'* **select "**Annual Use Visit**"**. You should also **select the project for the state you are working in**. Check and double check that the field eval date is correct. This will be pushed into each form.
    iii. Once you submit this point, links to survey123 forms should show in the popup. Launch all Survey123 forms from this link rather than directly from the Survey123 app. Forms will show an error message in red if you forget this, but they will allow you to submit.
    iv. Be extra careful when launching field visits and field forms, as the data contained in the field visit form will be used to distinguish this visit from previous ones. Make sure when you launch forms, the correct date is showing in the EvaluationID of each launched form.
    v. In the Woody Structure and Annual Use form, there are options to select based on the type of data you plan on collecting on the first page. Make sure these questions are checked like so:



Otherwise, you'll see questions regarding woody structure that you don't need to fill out.

L. Turn on LPI points on your field map and review photos from the crews to begin to set up the plot exactly as they did.
    i. Resources for plot setup:
        1. Rebar for monumented sites
        2. Azimuths contained in LPI data of field maps.
        3. GPS points from the Transect Starts shown in the LPI layer.
        4. GPS points from transect ends and lines connecting the transect starts and ends labeled “RevisitTransectEnds” and “RevisitTransectLines”.
        5. Photos of transect ends, beginnings, and plot overview
        6. Plot Drawing

Appendix 4. Hitch Plan Template

Crew Identification Information		
Name	*Position*	*Cell Phone Number*

Trip Dates			
Departure		***Return***	
Date	*Time*	*Date*	*Time*

Vehicle Information			
Make	*Model*	*License Plate*	*Description*

General Driving Route Planned

Emergency Contact Information		
Crew Member	*EC Name & Relationship*	*EC Phone Number*

Daily Hitch Plan				
Date	*Plot ID*	*Site Name*	*Field Office*	*Site Notes*

Backup/Oversample Plots				
Date	*Plot ID*	*Site Name*	*Field Office*	*Site Notes*

Overnight Camping Plan		
Date	*Location*	*Notes*