SIIPA
Modeling Tool
online map guide

ISM TRAINING GUIDE

UDAF

HISTORY

The Spatial Invasive Infestation and Priority Analysis **(SIIPA)** tool has been designed to use data from the Early Detection Distribution and Mapping System (EDDMapS) and apply a prioritization framework to the data, with the goal of assisting property owners, land managers and project managers with designing a treatment plan for their invasive plant populations.

We often have more infestations than we have resources to control them with, so effectively managing our land requires that we prioritize how we use those resources. Establishing a prioritization framework is also part of the adaptive management process which is an important part of land management in general because it enables us to make sure we are progressing towards our stated goals, and if not, re-evaluate any management actions.

The SIIPA model was based off the prioritization system found in The Nature Conservancy's (TNC) Draft Weed Management Plan, which uses four characteristics that are good umbrella characteristics for many of the others you might want to consider (Habitat Quality, Available Control Methods, Impacts of the species, and Extent) in the hopes that while this may not work for everyone, it would be helpful to most.

GET STARTED

Welcome to the Utah SIIPA modeling tools for EDDMapS. To access the online map **FIRST** head to: THE EDDMAPS WEBSITE to get your free account.

Use this guide as a starting place to understand some of the mapping capabilities and features. While we tried to build the tools to be easy to use and understand, some features might need a bit more of an explanation. While browsing through the guide, we encourage you to open up the online application and follow along. Click on any of the **video files** to see the tutorial movies and live tours. If you need further assistance, we are here to help.

The SIIPA model takes approximately 20 minutes to run from start to finish. Each step takes roughly 2-3 minutes and will run through all of the background processes in succinct order.

HELP

For additional help you can access some of the help videos at: http://gisdata.eddmaps.org/videos.html

Still need help? Contact Becca Winston: becca.winston@getmia.net

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GET STARTED

The SIIPA model is integrated with the EDDMapS platform and therefore you can access it through your existing EDDMapS account.
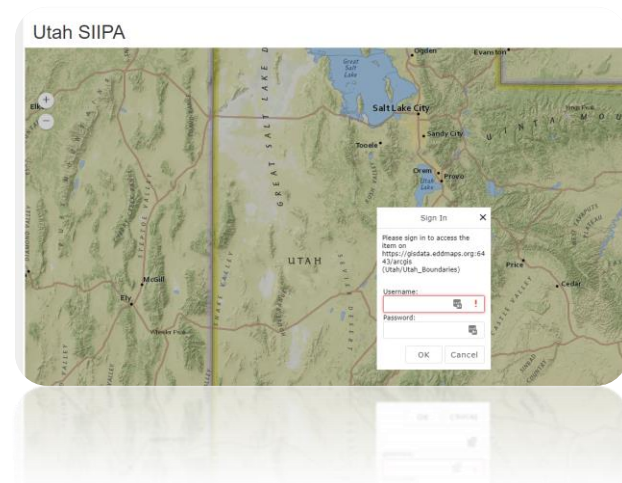*Don't have an existing account? You can sign up for your free account here.*

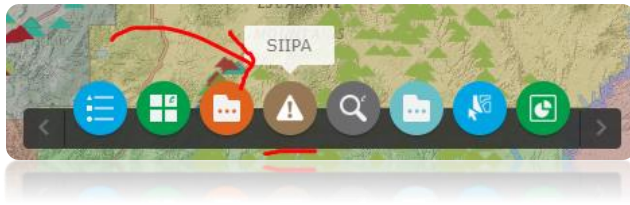Log on to your EDDMapS account and click on My EDDMapS at the top of the page
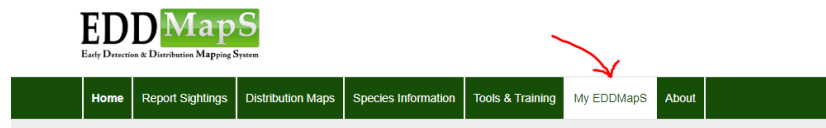
Then click on Projects on the left-hand side and click on the SIIPA UTAH icon.
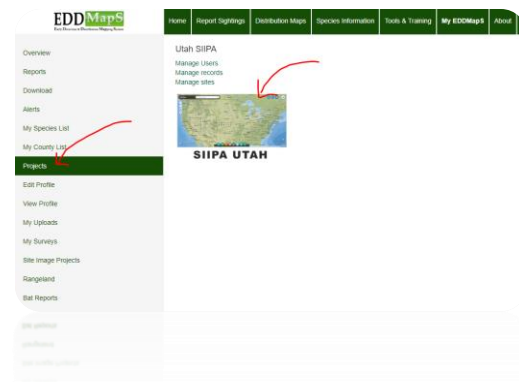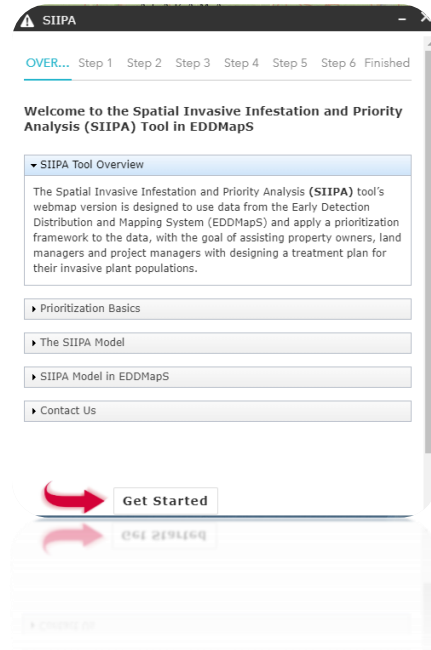

Enter in your username and password to begin the SIIPA model.
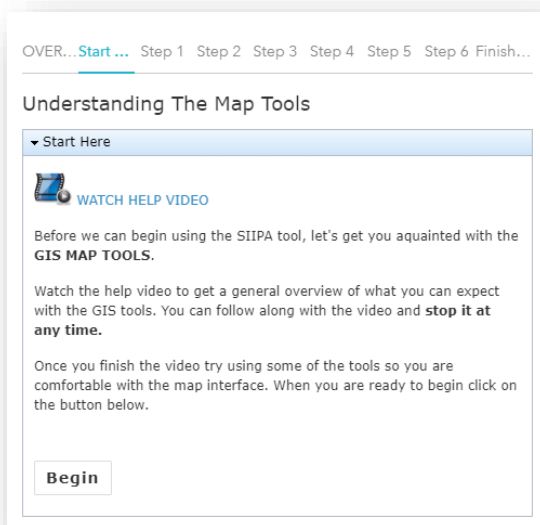
The first step is to open the SIIPA Wizard.

Here you will get a general overview of the tool and the prioritization basics. Read through the documentation to get a more thorough understanding of how the model was created and what it was designed to accomplish.

Optionally you can watch the SIIPA tool overview video.

When you're ready to begin click on **Get Started.**

The first screen will introduce you to the GIS MAP TOOLS VIDEO. Spend a few minutes getting to know the interface and some of the different tools before you jump into the actual model. When you are comfortable with the interface, click Begin.

STEP 1 – SELECT YOUR WEED RECORDS

First: Zoom into your area of interest on the map. As you zoom in, you will begin to see all of the weed points.

VIDEO TUTORIAL 1- SELECT YOUR DATA

Next: Select one of the drawing tools in the tool bar and then draw the polygon around your area of interest on the map.

You can draw as many project areas (polygons) as you need. If you make a mistake and want to clear the drawings, click on the trash can.

Finally: click EXECUTE.

The model will **automatically move you** through the steps as you execute each function.

Each step takes roughly 2 minutes to run as it performs joins, queries, and analysis on the selected datasets.

STEP 2 - HABITAT

To prioritize the different habitats where your invasive species occur, considering your management goals will be helpful in deciding how to prioritize. Certain goals, such as timber production, aquifer recharge or endangered species habitat, might align pretty closely with certain land/community types; or there might be certain habitat types that are rare, or typically well-maintained in your area of interest.

UTAH SIIPA

Step 2 - Prioritizing Habitats

VIDEO TUTORIAL 2- HABITAT

There is no single right way to prioritize, so use the table and your management goals to determine which groups of habitats are most important to you. You can use something generic, like 'high quality', 'medium quality' or 'low quality', but having at least a short description makes it easier for you to revisit this framework in the future, or to share with other stakeholders.

Important Questions to Ask:

- Which habitat types are most important to meeting your management goals?
- Which habitat types are most valuable to you and your management goals?
- Which habitat types provide the most economic and ecologic benefits?
- Which habitat types are usually the best managed?

First step: Figure out how many classes you want to group your data into. Next, select the number of classes by sliding the bar.

1. Select the number of classes by sliding the bar below. ?

2   3   4

Next step: Type in a description for each class based on your management goals from the previous step.

Description
highest priority
medium priority
lower priority habitats
very low priority habitats

Next step: Assign a weight to each class based on your priorities. The higher the weight the lower the priority.

Weight
1
3
5
9

Final step: Each habitat in the project area you selected has been populated in the table. The **General Land Use** column identifies the generalized classification of the habitat group while the **Detailed Land Use** column gives you more of a detailed description of the habitat type.

Assign one of the classes from the previous step to each habitat type in the table. Then hit Execute.

*this will run for approximately 2 minutes

STEP 3 - CONTROL

To prioritize the available control methods for each species, things to might consider would include:

- herbicides that are known to be effective treatments
- how often you would need to re-treat
- how each species spreads (wind, wildlife, water, etc.)
- how long the seeds/spores stay viable and germination rates

*There are plenty of resources available that have thorough treatment information and summaries of current research on different control methods.

There is no single right way to prioritize, so use the information below and your management goals to figure out which types of available control methods are most important to you. You can use something generic, like 'easy', 'medium' or 'hard to control', but having at least a short description makes it easier for you to revisit this framework in the future, or to share it with other stakeholders.

VIDEO TUTORIAL 3- CONTROL

Important Questions to Ask:

- Which species will be the easiest to control and/or eradicate, especially over the long term?
- Which species will take the least resources to control?

First step: Figure out how many classes you want to group your data into. Next, select the number of classes by sliding the bar.

1. Select the number of classes by sliding the bar below.

Next step: Type in a description for each class based on your management goals from the previous step.

Next step: Assign a weight to each class based on your priorities. The higher the weight the lower the priority.

Description	Weight
highest priority	1
medium priority	3
lower priority habitats	5
very low priority habitats	9

Final step: Each species population in your project area has been populated in the table. Both the common and scientific names have been provided.

Assign of the classes from the previous step to each species in the table. Then hit Execute.

*this will run for approximately 2 minutes

STEP 4 – IMPACT

To prioritize the impacts of each species, some things you might consider include:

- if the species alters ecosystem processes such as fire frequency, sedimentation, or nutrient cycling
- how much environmental and economic harm it causes
- if it easily displaces native species
- if it invades intact or high-quality habitat versus disturbed habitats
- how quickly it grows and spreads

State or regional exotic plant lists are helpful resources. There is no single right way to prioritize, so use the information below and your management goals to figure out which types of impacts are most important to you. You can use something generic, like 'high', 'medium' or 'low impacts', but having at least a short description makes it easier for you to revisit this framework in the future, or to share it with other stakeholders.

Important Questions to Ask:

- Which species cause the most damage to natural habitats?
- Which species will take the least resources to control?
- Which species cause the most damage to the ecologic or economic health of your area of interest?

VIDEO TUTORIAL 4- IMPACT

First step: Figure out how many classes you want to group your data into. Next, select the number of classes by sliding the bar.

Description
highest priority
medium priority
lower priority habitats
very low priority habitats

Next step: Type in a description for each class based on your management goals from the previous step.

Next step: Assign a weight to each class based on your priorities. The higher the weight the lower the priority.

Weight
1
3
5
9

Final step: Each species population in your project area has been populated in the table. Both the common and scientific names have been provided.

Assign of the classes from the previous step to each species in the table. Then hit Execute.

*this will run for approximately 2 minutes

STEP 5- EXTENT (SIZE OF INFESTATIONS)

The next step is to prioritize the extent, *or size*, of each population. Generally, it is assumed that **targeting smaller infestations first** will give you more 'bang for your buck' because smaller infestations typically are easier to control, take less resources to treat and grow at a faster rate than larger, well-established infestations. However, you might want to target the larger, source populations instead. **There is no single right way to prioritize**, so use the information below and your management goals to figure out which extent ranges are <u>most important to you</u>.

Depending on the type of extent data available for your dataset, you have been assigned one of three different extent types: No Extent, Gross Area, Infested Area.


VIDEO TUTORIAL 5- EXTENT

Important Questions to Ask:

What size infestation is most important to treat first?

What size infestations will be easiest to control long term?

Which size infestations affect long term total infestation levels and impact your management goals the most?

First step: Figure out how many classes you want to group your data into. Next, select the number of classes by sliding the bar.
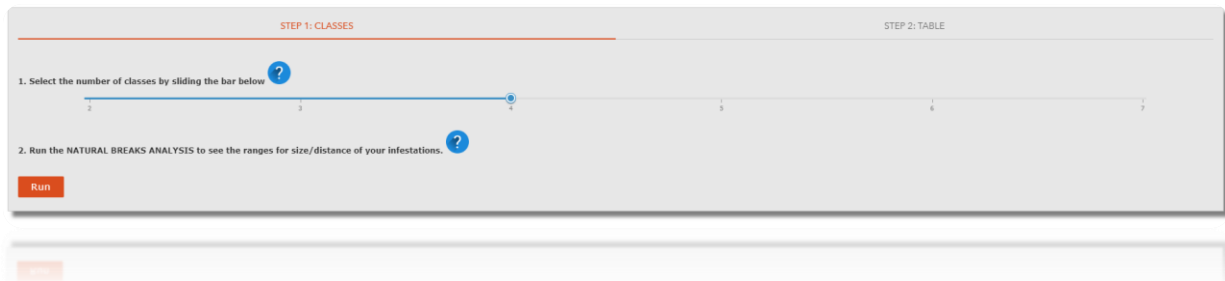
DEPENDING ON WHAT DATA HAS BEEN RECORDED FOR YOUR WEED POINTS, THE NEXT STEP LOOKS AT EITHER THE DISTANCE BETWEEN YOUR WEED POINTS OR THE SIZE OF THE INFESTED AREAS (ACRES)

Next Step: Run the Natural Breaks Analysis tool to see the ranges for either the size of your infestations or the distance between the populations. The results are populated based on the number of classes you selected from the previous step.

STEP 1: CLASSES   STEP 2: TABLE

The range for Class 1 is greater than 60.62 meters
The range for Class 2 is 0 meters to 60.62 meters
The range for Class 3 is 0.0 meters to 0 meters

3. Complete the table below by assigning one of your classes (from previous step above) to the number range below. Then fill out the MAX column with your maximum numbers for the range. Finally, assign a weight to the designated classes.

Class	Min (in meters)	Max (in meters)	Description	Weight
1	Greater than 0		highest priority	1
2	0 to	0	medium priority	5
3	0 to	0	lowest priority	9

Go Back   Execute

This step can take up to 2 minutes depending on size

*You can go back and select a different number of classes and re-run the tool to see a different result as many times as you want.

Next Step: Using the results from the previous step, fill in the Max Column

The range for Class 1 is less than 0.04 acres
The range for Class 2 is 0.04 acres to 0.1 acres
The range for Class 3 is 0.1 acres to 0.2 acres
The range for Class 4 is 0.2 acres to 0.83 acres

3. Complete the table below by assigning one of your classes (from previous step above) to the number range below. Then fill out the MAX column with your maximum numbers for the range. Finally, assign a weight to the designated classes.

Class	Min (in acres)	Max (in acres)	Description	Weight
1	Less than		highest priority	1
2	0 to	.1	medium priority	3
3	.1 to	.2	lower priority	5
4	.2 to	.83	lowest priority	9

You can use the results as a general starting point too and enter in any range of number breaks for your data.

Next step: Type in a description for each class based on your management goals from the previous step.

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Next step: Assign a weight to each class based on your priorities. The higher the weight the lower the priority.

Description
highest priority
medium priority
lower priority habitats
very low priority habitats

Weight
1
3
5
9

Then hit Execute.

*this will run for approximately 2 minutes

STEP 6 – FINAL RANKING

Depending on your management goals, one characteristic might be more important than the others. It's important to give the characteristic the weight that support your management goals.

Important Questions to Ask:
- Which characteristic is most important to meeting your management goals?
- Which characteristic most affects your ability to maintain infestations at the lowest feasible level?

Depending on your management goals, rank these characteristics according to your priorities.

It's important to give the characteristic the weights that support your management goals.

VIDEO TUTORIAL 6- FINAL RANKING

For example, someone concerned primarily with **timber production** or **endangered species** might rate Habitat and Impacts as more important characteristics and give them a higher percentage:
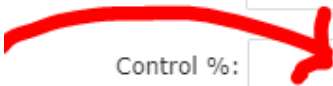
Or if you really want to focus on the species that are the most easily controlled, you would give Control Methods a higher percentage of the final score:

Extent %: 20

Habitat %: 20

Impact %: 20

Control %: 40

The default is to rank them **equally at 25% each**, and any changes should total 100%.

Next Step: Select the cut off point for the ranked infestations that will be shown in the results. The results are ranked 1-9 with the 9's being the lowest priority.

If you aren't interested in your lower ranked weed infestations, here is where you can exclude them from the final priority grid. Use the slider to select the range of your DESIRED rankings for your individual report. If you want to include them all, slide it to the far right.

2. Select the CUT-OFF point for your lowest priority. ?

2   3   4   5   6   7   8   9

Execute

After selecting your cut-off point, hit Execute.

*this will run for approximately 2 minutes

FINAL RESULT

Once you have run the final step, the SIIPA model is complete and will populate the map.

UNDERSTANDING THE RESULTS

The priority score given to each population is named 'Final Rank' in the attribute table, and we use the terms interchangeably here. Infestations that receive a priority score/Final Rank of 1 are your **first priority,** which means the lower the priority score, the higher of a priority it actually is.

It is possible you may have enough infestations that you already realize you will not be able to treat them all in your given timeframe (often a year), so you might want to start by only focusing on those that have a priority score/final rank of at least X (i.e. 1 - X). In the event that you complete all the treatments and still have time or resources to continue treating, you can always revisit the priority map to include more of your infestations.

VIDEO TUTORIAL 7- FINAL RESULTS

You will get 3 different parts to your result:

- The Final Results options
- The Final Results Map Layer Legend
- The Final Results and Grid drawn on the map

After completing the model, you have 4 different options for exporting your data. You can do any single one or a combination of them.

PRINT MAP - Use this option to get a custom printed map.

Give your map a custom title

Specify which layout you would like

Specify which format you want it in

Advanced Features: Specify a fixed scale, show labels, change the map author, choose to not include the legend, specify DPI

RUN REPORT - You have the option of running a report on your final results.

Each report includes:

- A map image
- Species Table
- Habitat Table
- Prioritization Table
- Priority Table
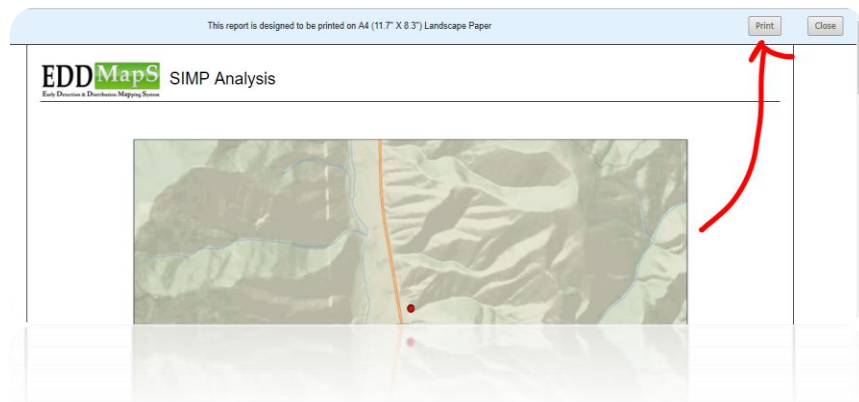
You can save your report to your local computer or print it directly.

DOWNLOAD FILE (ESRI GDB) - You can download an ESRI file geodatabase to your local computer. After downloading the zipped file, right click on the file name to unzip it. You can then open the contents inside ArcMap or ArcCatalog. The geodatabase includes the following files:

- Assess feature class
- Priority Areas feature class
- Species Table

- Habitat Table
- Raster Clip
- Ranges Table
- Prioritization Table

2. THE FINAL RESULTS MAP LAYER

The final model results are automatically drawn on the map and 3 layers are added to the map layer list: the assess feature class, project area and the priority areas for treatment.
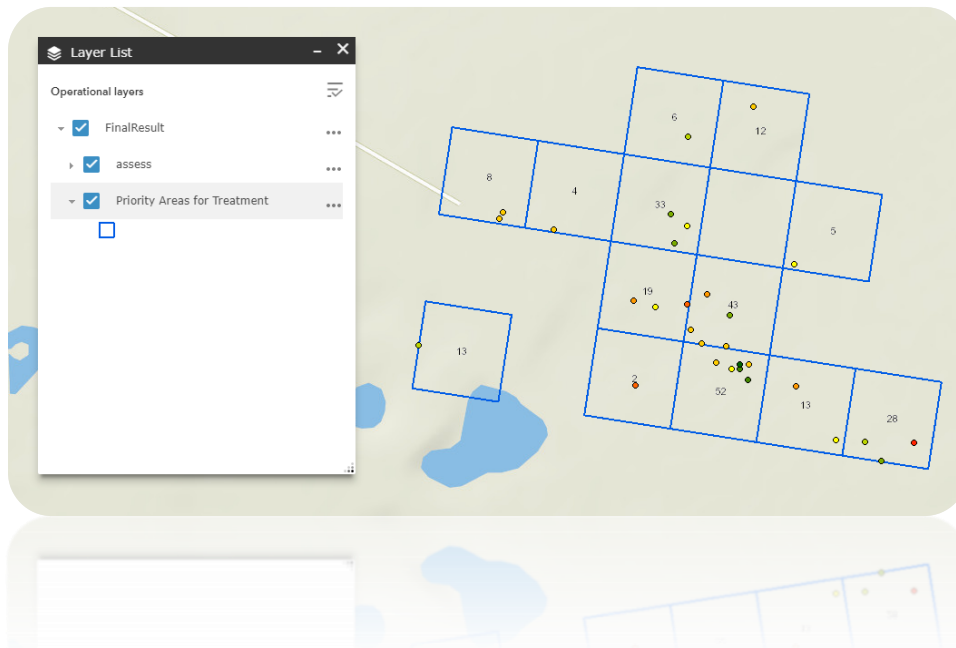
PRIORITY AREAS FOR TREATMENT:

How the grid is created and given a score

To create the grid that becomes your Priority Areas map, this tool first figures out the total area covered by your selected invasive species data. Based on that size, it determines the appropriately sized cell in acres for your Priority Areas map (see the table below). Each cell is then given its own Final Rank score by summing the Final Rank priority scores of all the infestations that occur inside the cell. The final product only includes cells that contained at least one infestation. The tool also adds a field for Treatment Status, so that you can track what percentages of the cells have been treated.

It is assumed that you will want to start by targeting the least infested cells, or those with the lowest Final Rank. We assume this because you tend to get the biggest 'bang for your buck' by stopping infestations before they become firmly established and

protecting the intact native habitat that surrounds it. If this is the case, you will want to start with the cells that have the lowest Final Rank number, and then work on the next lowest, etc.

Total acreage covered	Acres in each cell
< 10,000	10
10,000 – 50,000	25
50,000 – 200,000	50
200,000 – 400,000	100
> 400,000	250

ASSESS FEATURE CLASS

This layer contains all of the mapping data and is automatically ranked and symbolized when it is added to the map. The higher the priority number, the LOWER it falls on the priority list based on your model input.
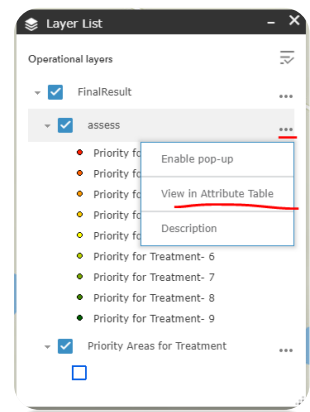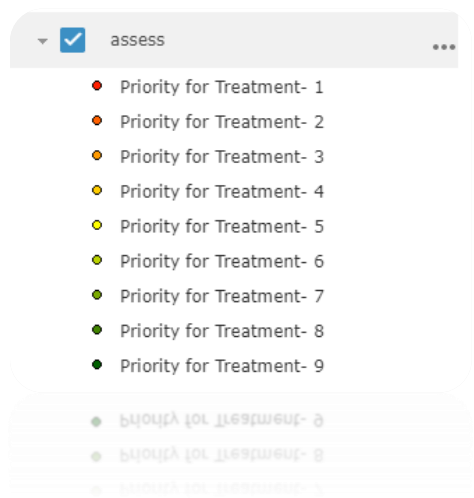
To view the attribute table, click on the 3 dots, and then "view in Attribute Table".

To take the attribute table into Excel for further analysis, click on "options" and then export all to CSV.

To see information on each point in the map, enable pop ups by clicking on the 3 dots again.
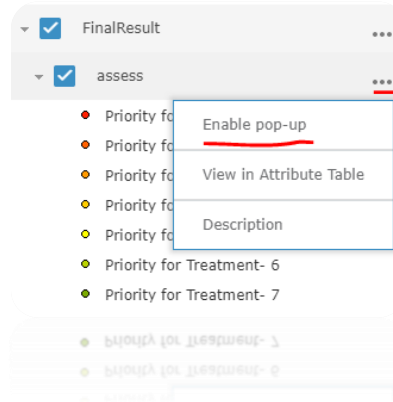
ADDITIONAL TOOLS

Inside the online map application, we have built in some additional tools to help make your maps more custom. You can use any combination of them to explore the data in more detail and add features to your maps. Watch the Tool Overview video for a short demonstration.

BASEMAP SELECTOR

Switch the base map background layer to better display your map features or even create your own mashup.

Select the Base Map Switcher tool.
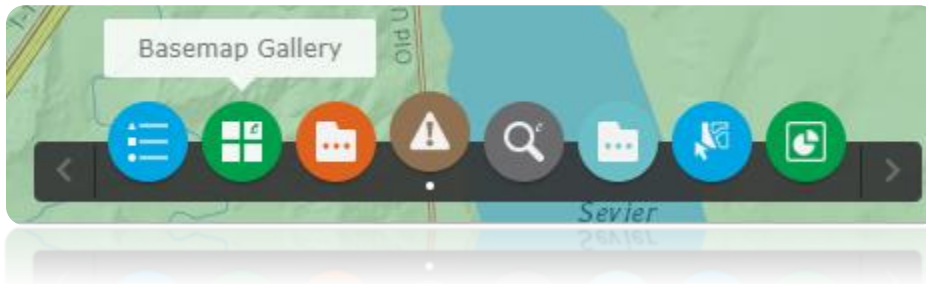
Then select one of the other base maps. To create your own mashup, click on the plus sign next to the base map to get it added in addition to the existing one.
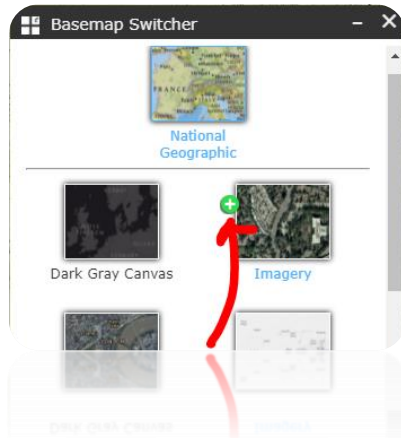
Then use the slider to make one more transparent or opaque.
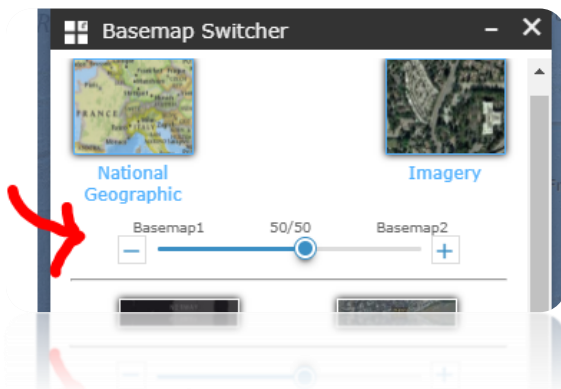
You can select any base map layer to be added to the map by just repeating that process.

ADD DATA

You can add custom content to your online map through 2 tools:

Utah Layers Tool and **Add Data Tool.**

To add preconfigured Utah layers, select the Utah Layers tool.
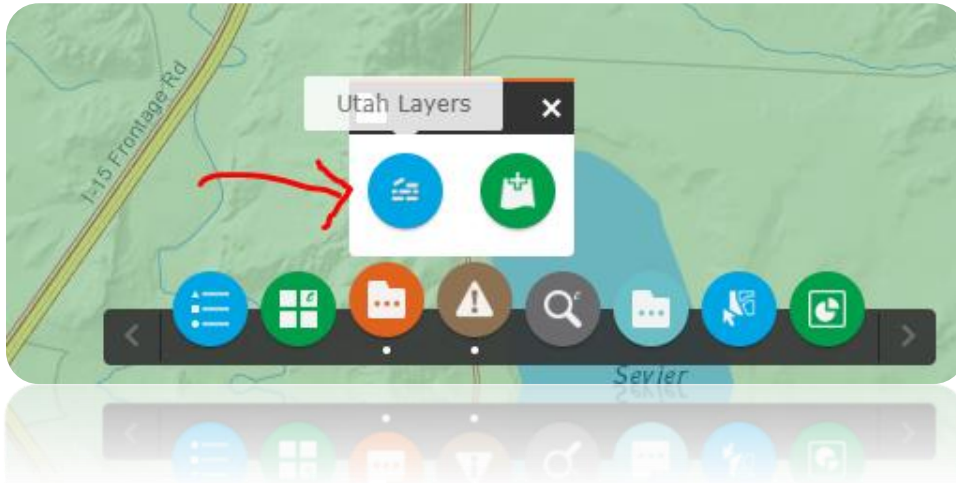
This gives you a choice of Utah layers to add to your map display. You can turn the layers on/off by simply selecting the layer.
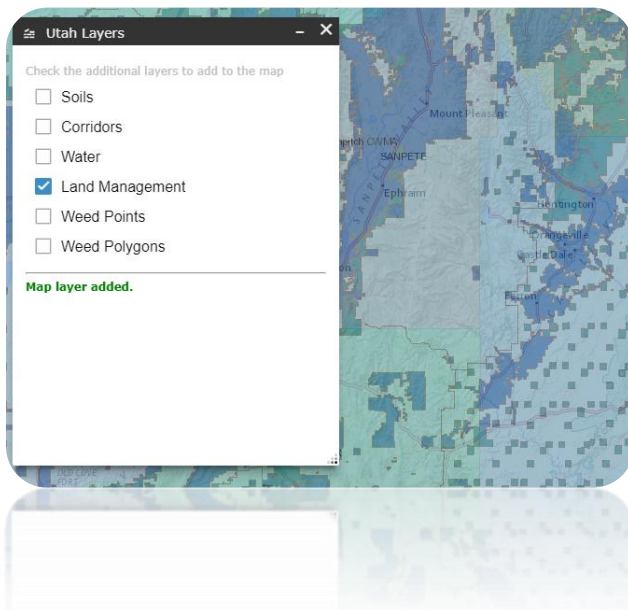
The second way to add data is Inside the **ADD DATA TOOL**. Here you can add content through ArcGIS online, a custom URL, or adding your own files.
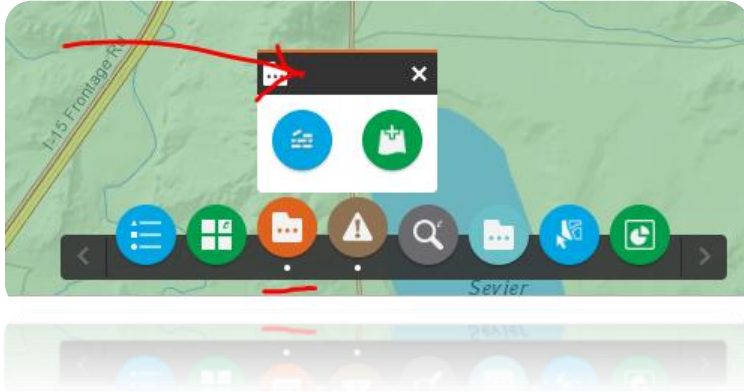
1. ArcGIS Online- type in the search box to locate available layers for your map
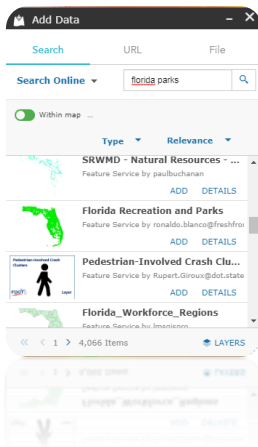
Select the ones you want by clicking ADD. You can add as many layers as you want.
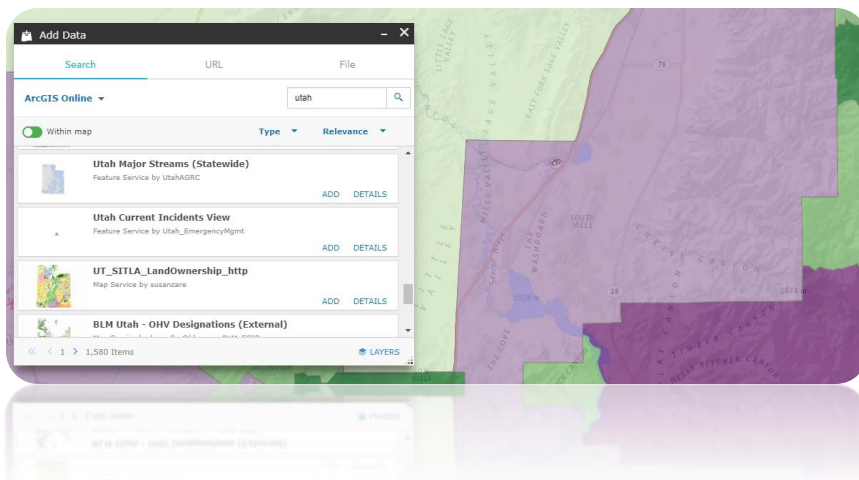
Once they are added to the map window, they will be added to the Map Layers also. You can turn them on/off by unchecking the box.

To remove them from your map, select the Layers from the bottom right of the panel and then click on the trash can.
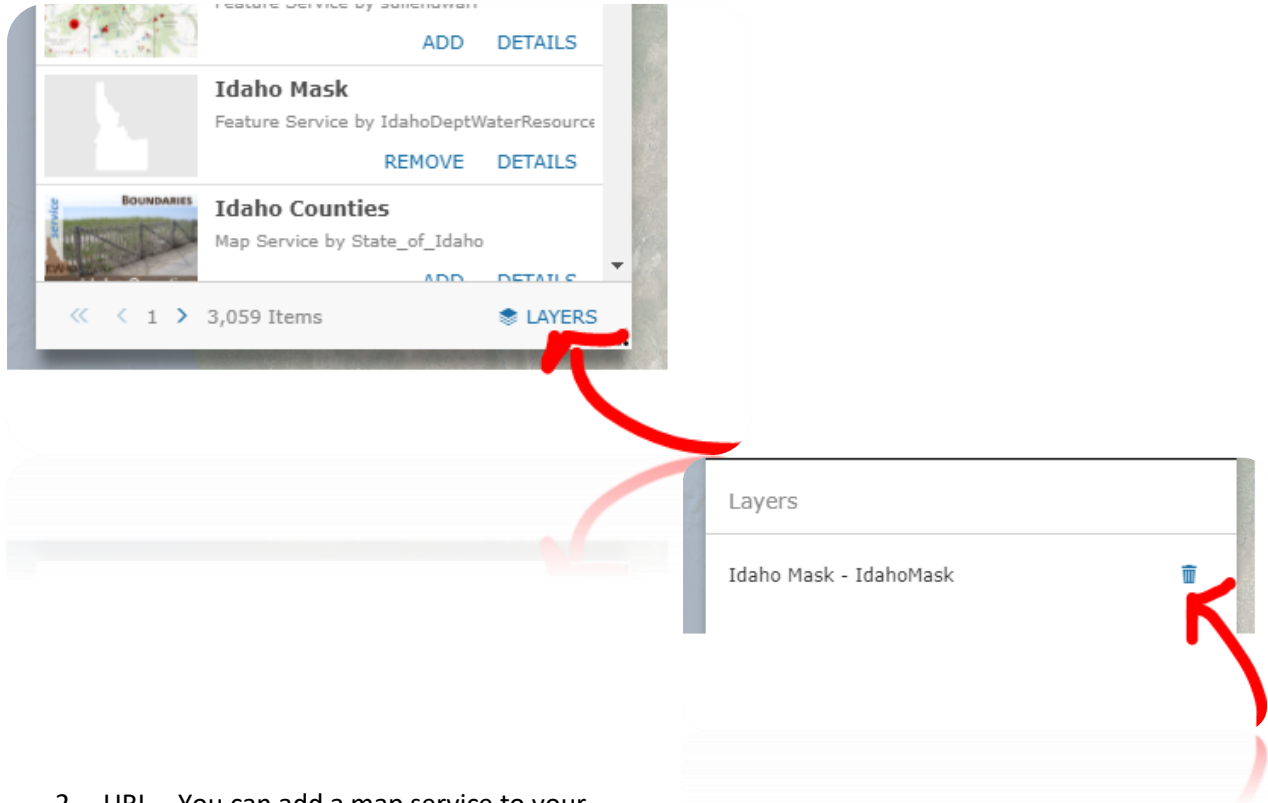
2. URL – You can add a map service to your online map by adding the URL to your map service inside the box.
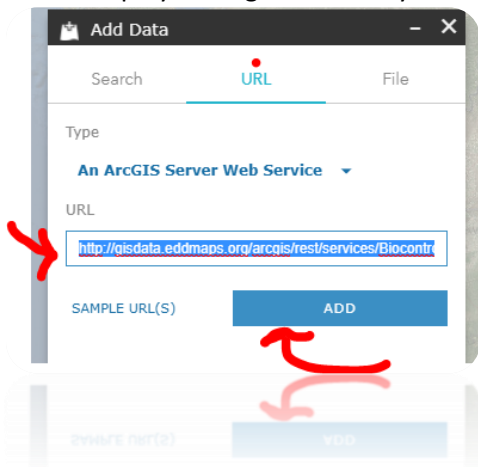
The map service is added to the map and the Map Layers.

To remove them from your map, select the Layers from the bottom right of the panel and then click on the trash can.

3. File- You can add your own custom shapefiles, csv files, gpx files, and geo json files to the map by dragging and dropping them or browsing to the location.
   All files should be in a zipped archive and in a geographic coordinate system to be drawn accurately on the map.
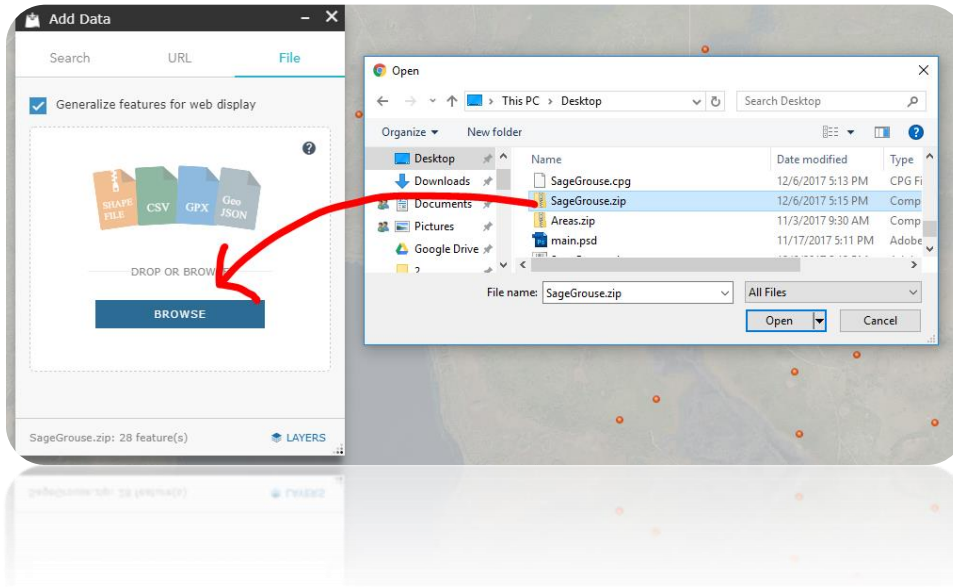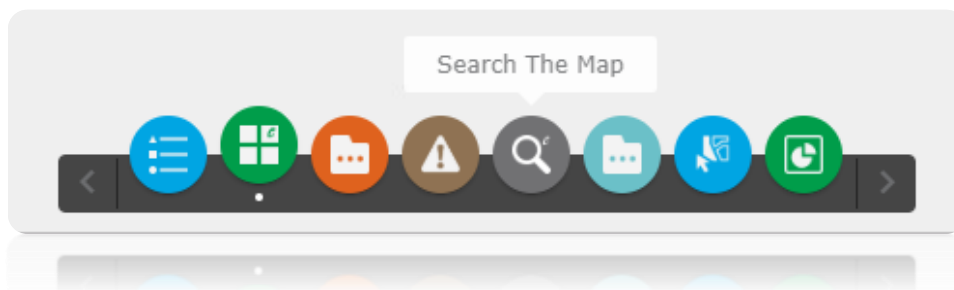

Once they are added to the map display they will be added to the Map Layers also. You can turn them on/off by unchecking the box.

To remove them from your map, select the Layers from the bottom right of the panel and then click on the trash can.

SEARCH FOR DATA

There are 3 ways you can query specific weed points, biocontrol releases, or county data utilizing the Search tool.

1. By Shape- You can query features in the map by drawing shapes on the map.
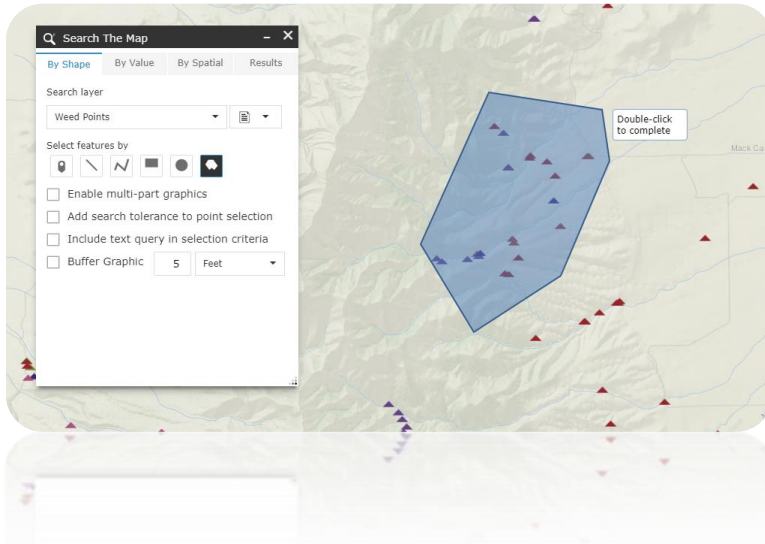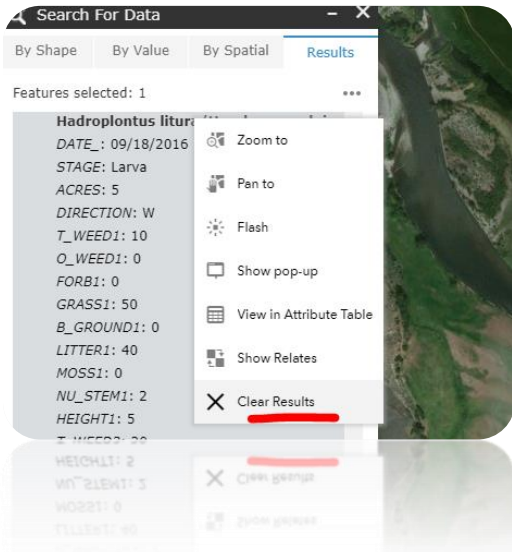

First select the layer you want to query and then select the shape you want to use.

Optionally you can add a search tolerance and a buffer to your shape.

With the shape selected, draw your area of interest on the map.

The results are loaded in the map and the map will zoom to the area. The attribute table will automatically open below the map and you can scroll through the fields (columns). You can click on the points to get more information.
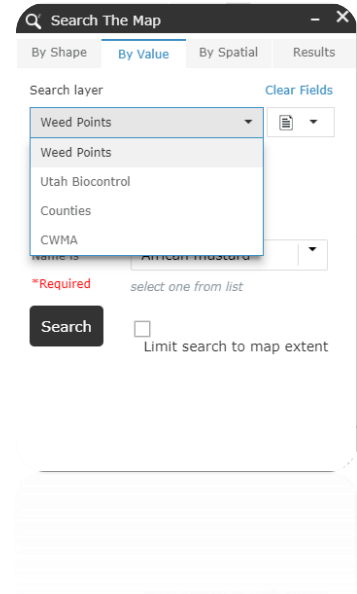
To clear the results, click on the dots to the right and select it.

2. By Value – Allows you to search by specific attributes (weed common names, weed rank, county, etc.)

Select the layer you want to query/search and then select the way you want to search the data.
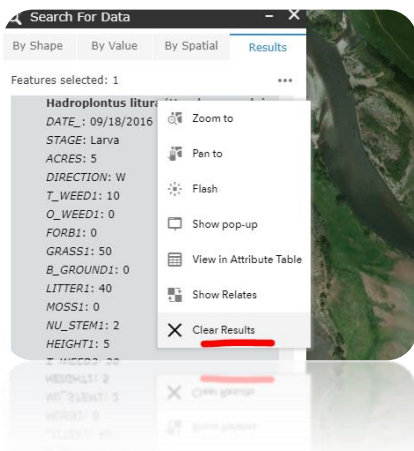

Optionally you can elect to limit the search to the map extent by selecting the box.
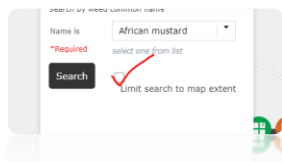
Then click Search.

The results are loaded in the map and the map will zoom to the area. The attribute table will automatically open below the map and you can scroll through the fields (columns). You can click on the points to get more information.
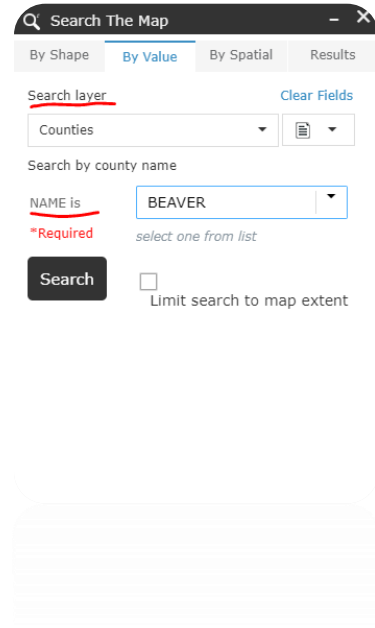

To clear the results, click on the dots to the right and select it

3. By Spatial- allows you to search within features and distances

To search by a spatial attribute, first select the By Value tab and select either the Counties or CWMA layer. Then select the name.

Then click on the By Spatial tab in the tool and select a search distance buffer. Be sure to select the "apply buffer" tool. This buffers your feature with your specified search distance.
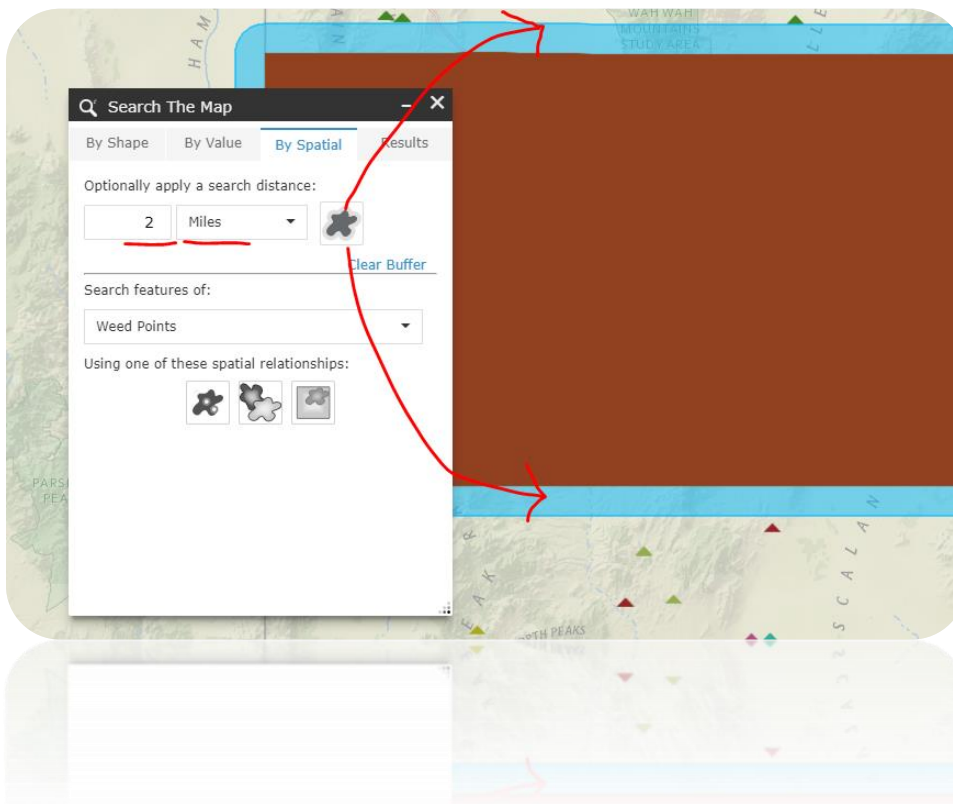
Next select the layer you want to search and then select which spatial relationship rule to apply.

Search features of:

Weed Points ▾

Using one of these spatial relationships:

intersected by

~~intersected by~~
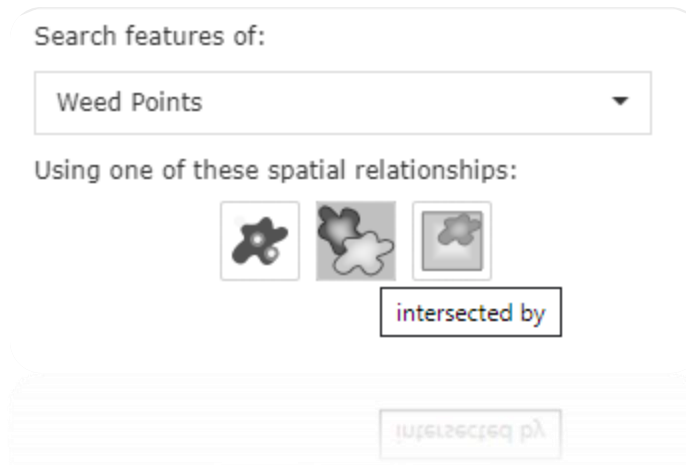
The tool runs and the results are drawn on the map as well as in the attribute table below. You can click on any of the points on the map or in the table to get more information on the infestations.

DRAWING

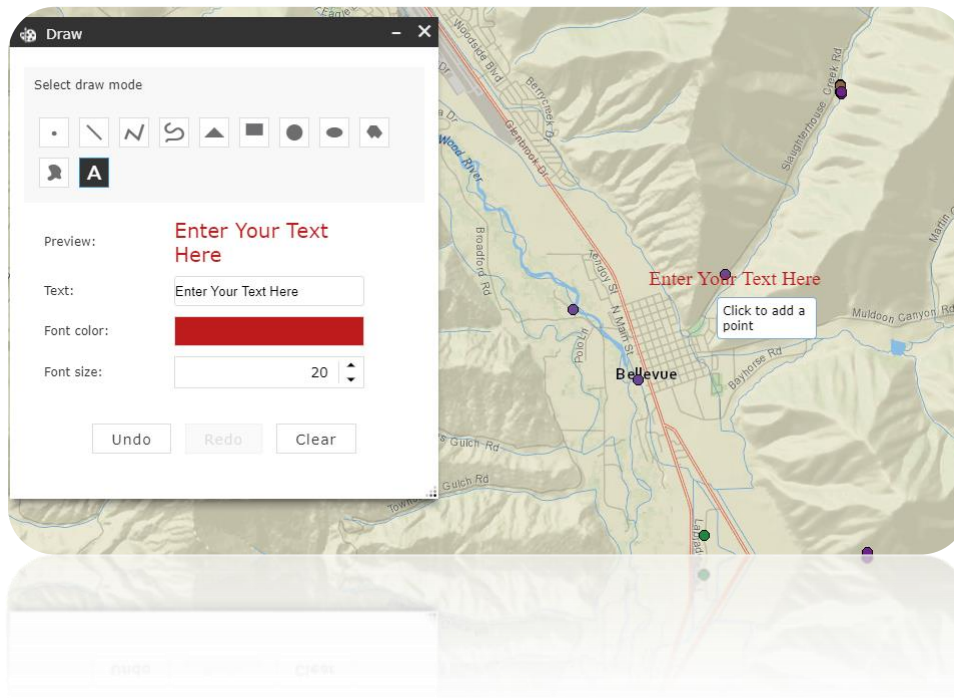You can add your own custom text, shapes, and markup to your maps for printing.

Select the Draw tool and select one of the draw modes: shapes, text, or lines.
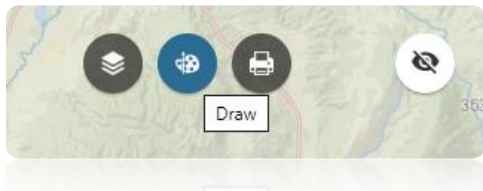
Draw

For shapes, select the color options, transparency, outlines, and text content. Then draw the shape on the map.
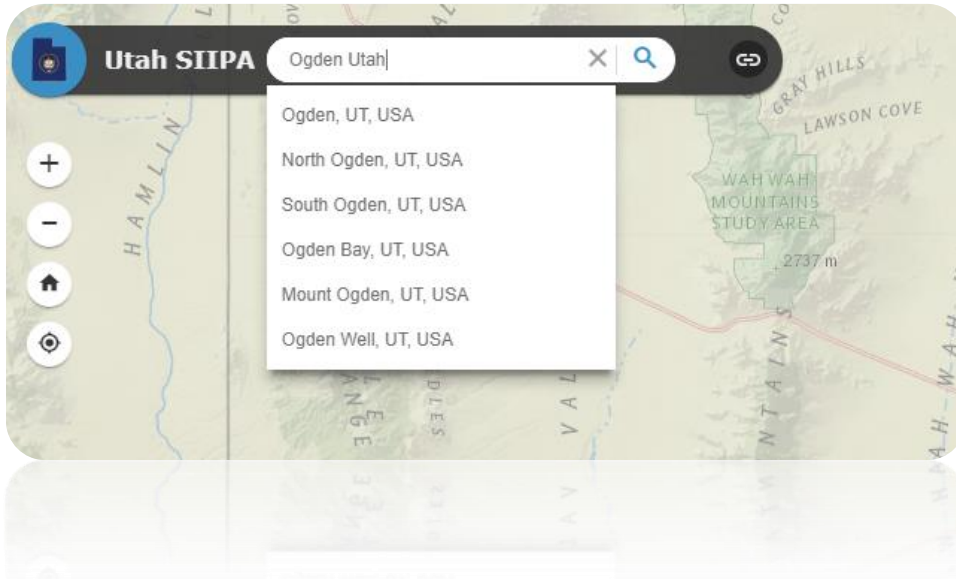
For text, select the color and font size and type the desired text in the box. Then click the spot on the map.
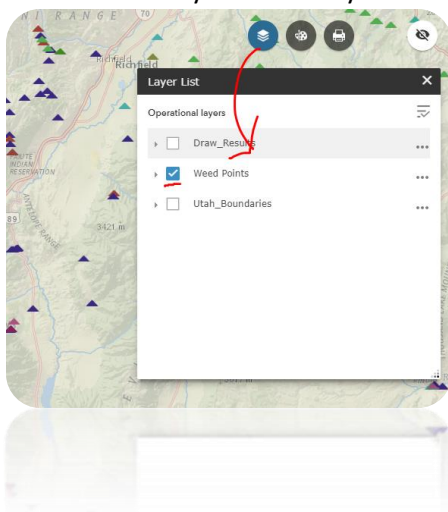

Clear your graphics by selecting the Clear button.

To find specific areas on the map you can use the top search bar geocoder.

SNAPSHOT VIEW

You can get a snapshot view of the distribution of weed rankings by using the Snapshot View tool.

First make sure your weed layer is turned on in the Layer List widget and zoom into the area of interest on the map.

Next, open the Snapshot View tool to get an interactive pie chart. This shows you the overall distribution of the weed data in view. By selecting the different pie divisions, the corresponding points are highlighted in the map.
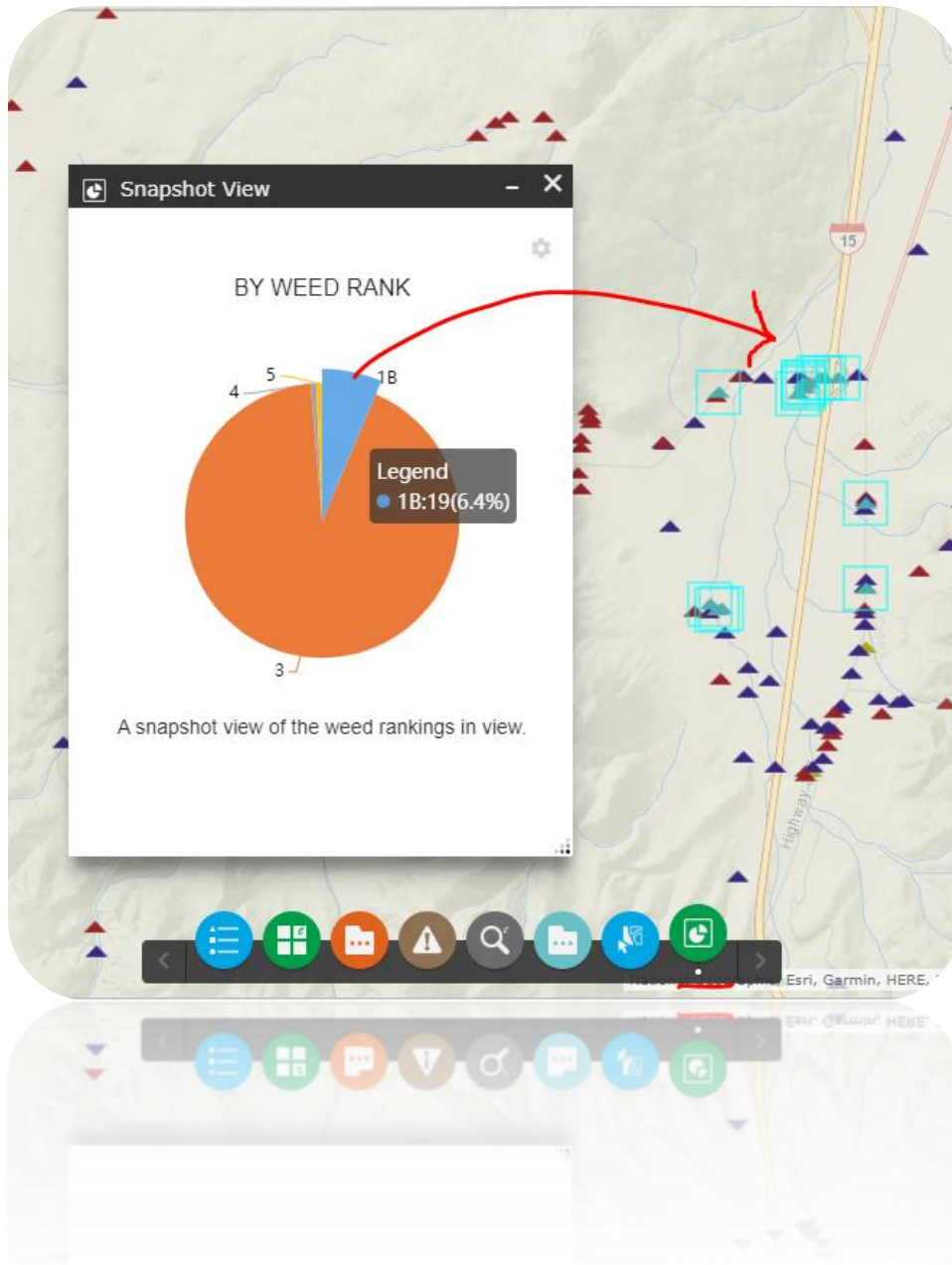
If you need additional help or have questions, please contact us directly

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