Tutorial for using the CNDDB layer in the BIOS 5
"CNDDB & Spotted Owl Viewer"

California Department of Fish and Wildlife
California Natural Diversity Database
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The CNDDB & Spotted Owl Data Viewer is a BIOS bookmark that opens the BIOS 5 viewer with California Natural Diversity Database (CNDDB) and Spotted Owl Database data preloaded for you. Using BIOS, you may view CNDDB data spatially, add labels, and print maps without the need to have GIS software installed on your computer. More complex spatial analysis and data manipulation will still require the use of a full GIS in conjunction with RareFind.

Additional BIOS data viewer support is also available in the BIOS User Guide and the BIOS Frequently Asked Questions.

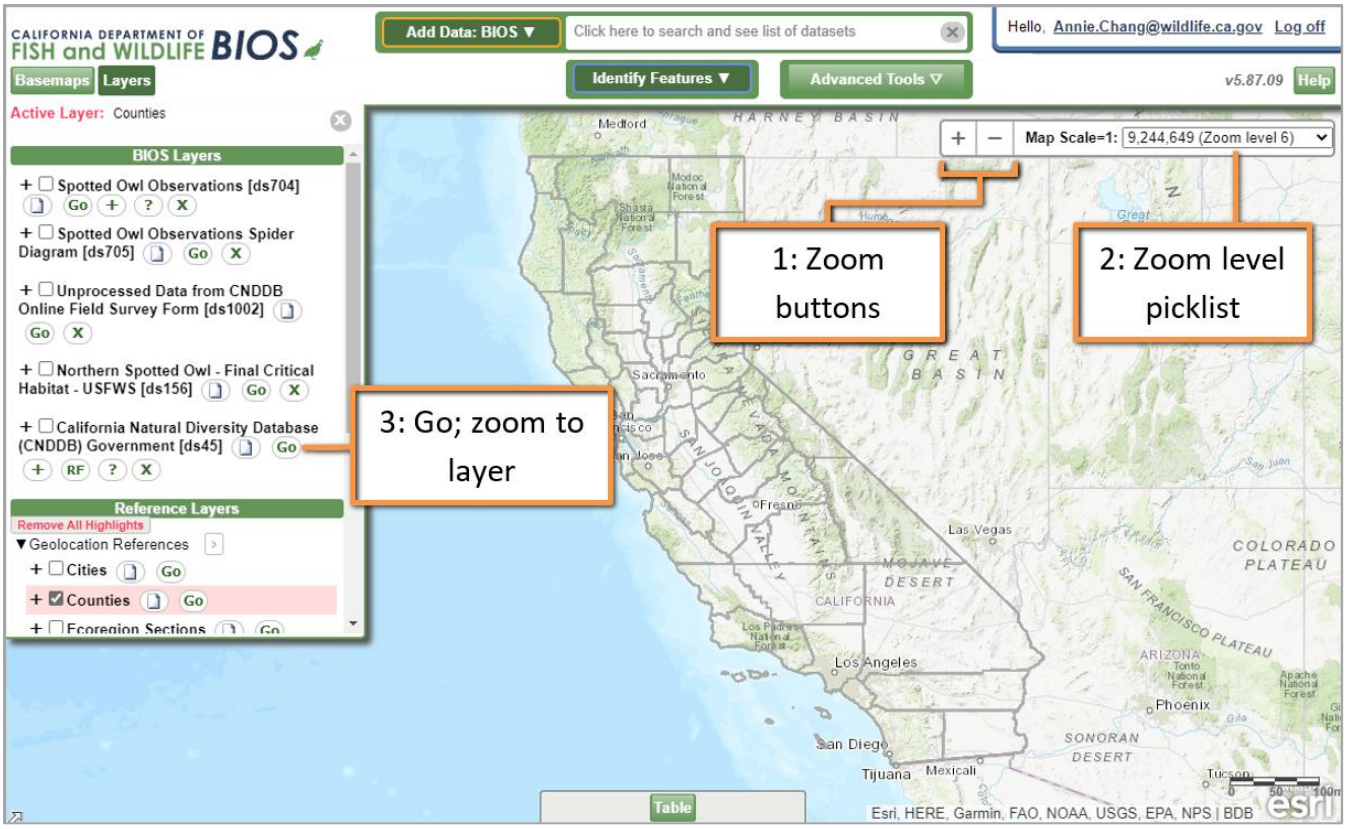
Contents

Navigating

Navigation in BIOS 5 viewer is achieved with the mouse or keyboard. You can pan the map in any direction by a simple click and drag.

To zoom in or out:

- Scroll the mouse wheel
- Hold Shift on your keyboard + click-and-drag with your mouse to form a box and zoom to that box's area (Ctrl + Shift + click-and-drag zooms out)
- Use the "+" and "-" keys on the keyboard
- Double-click to zoom in
- Press the "+" or "-" buttons on the map [1]
- If there is a particular reference scale you prefer, you can quickly select a scale from the Map Scale pick list [2]. When the zoom level is at 15 or greater, the CNDDB Element Occurrences are labeled with scientific name.
- Click "Go" next to a layer to zoom to the data in that layer [3]



Adding Layers

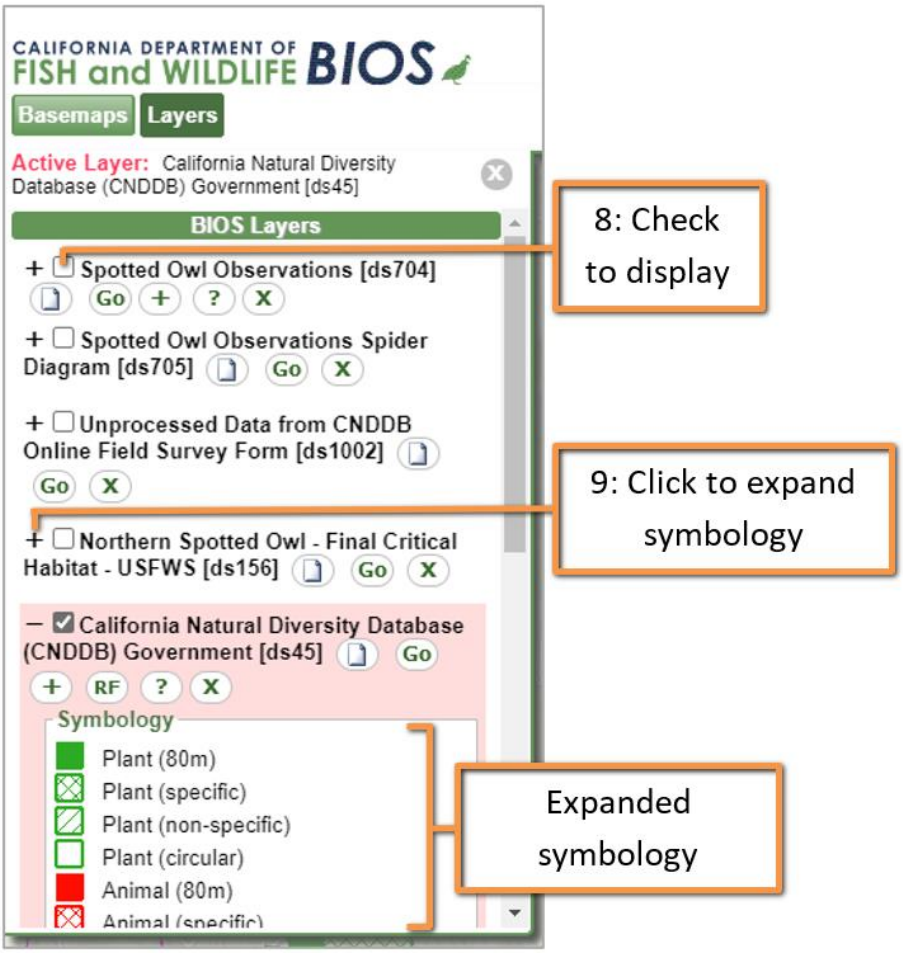
The CNDDB & Spotted Owl Viewer bookmark comes preloaded with the following data sets in the BIOS Layers portion of the Table of Contents [4]:

- CNDDB (ds45 or ds85)
- Unprocessed Data from CNDDB Online Field Survey Form (ds1002)
- Spotted Owl Observations (ds704)
- SPOW Obs Spider Diagram (ds705)
- N. SPOW – Critical Habitat (ds156)

Additionally, the BIOS viewer has several Reference Layers [5] preloaded in the Table of Contents. The viewer also allows the use of additional biogeographic data layers in conjunction with the CNDDB data layer. The “Add Data: BIOS” button [6] can be used to add other BIOS data layers, such as Critical Habitat layers, vegetation, and other species data layers. More information about the BIOS tools is available under the “Help” button [7].

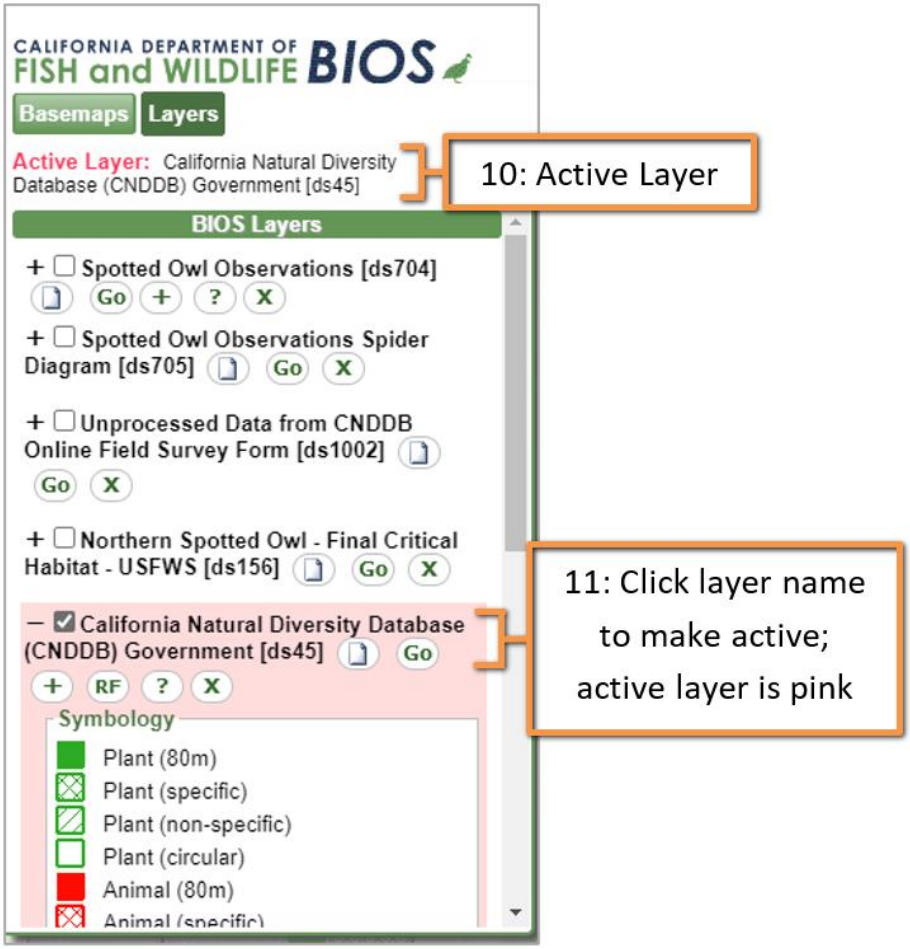
Displaying Layers

Click the checkbox of each layer that you want displayed [8]. It helps to zoom in when displaying the CNDDB data to avoid long drawing times. The symbology associated with a data set can be expanded in the Table of Contents by clicking the "+" to the left of the layer title [9].



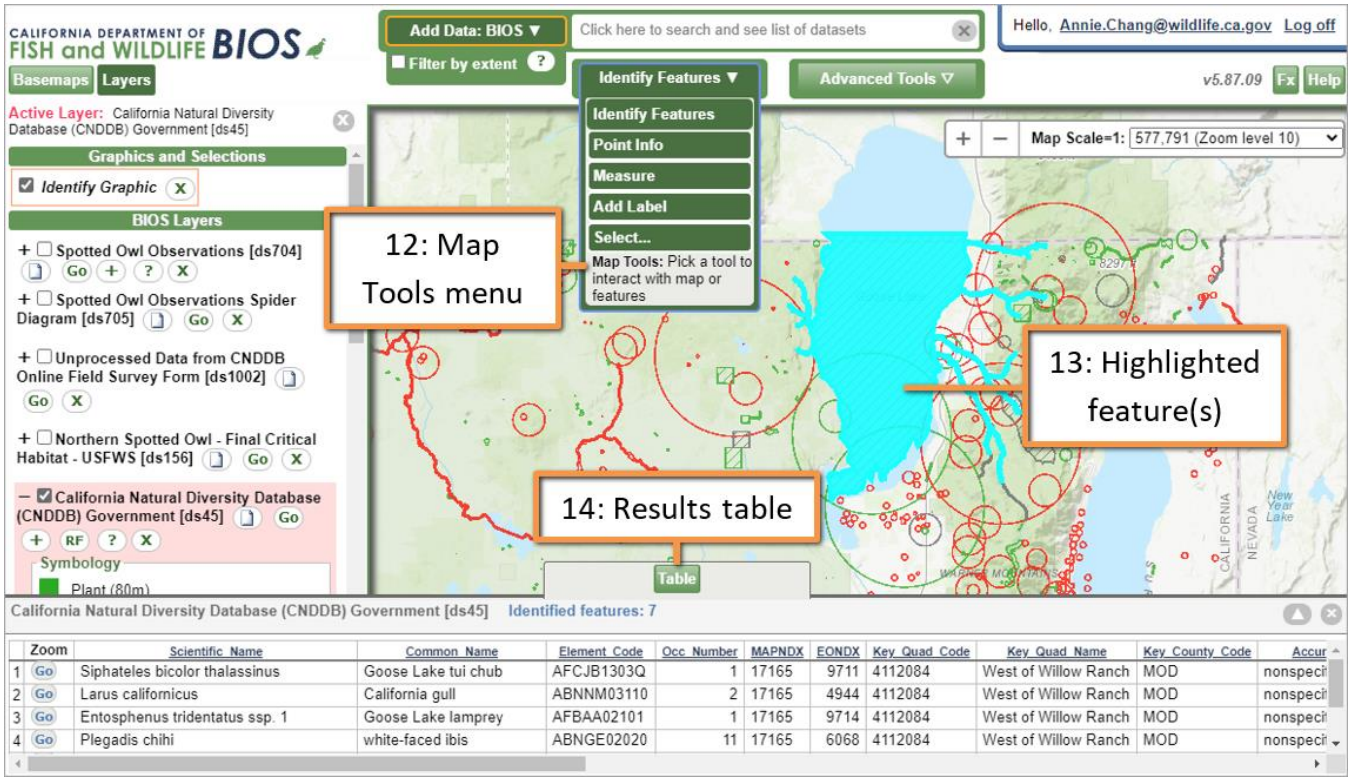
Activating a Layer

Tools in BIOS that interact with data layers only work on the "Active Layer." Only one layer at a time can be active. You may check the Active layer display at the top of the Table of Contents to see which layer is active [10]. To make a layer active, simply click on the name of a layer [11]. You will see a pink box appear around the layer indicating it is active, and the name of the layer will show in the Active Layer display above the Table of Contents.



Identifying Features

Click on the layer name you are interested in to make it the Active Layer. From the Map Tools menu [12], select “Identify Features” to get additional information about occurrences by activating (clicking) the tool and then clicking the feature of interest (layer must be Active Layer). The features you click on will highlight in blue [13] and a table will expand from the bottom and return the attributes of the identified feature(s) [14].

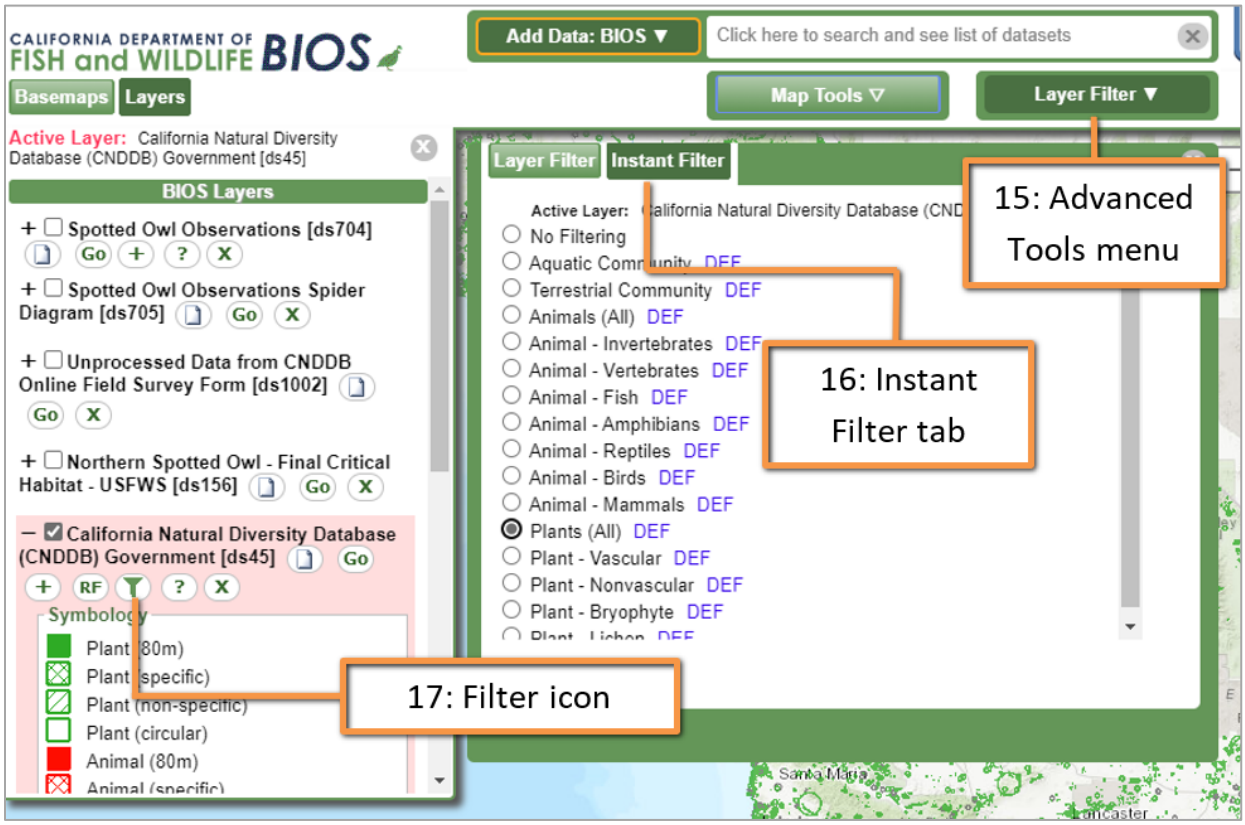


Filtering Element Occurrences

One of the most requested feature enhancements by CNDDB subscribers using BIOS to view the CNDDB Element Occurrences has been the ability to view subsets or only a specific portion of the CNDDB data. This may be helpful to make maps clearer to understand where there are many CNDDB occurrences. For example, one map may be filtered to show only plants, and another map to show only animals for the same location. This ability is now available in the Layer Filter tools under the Advanced Tools menu. Currently there is the easy-to-use Instant Filter and the more advanced Layer Filter.

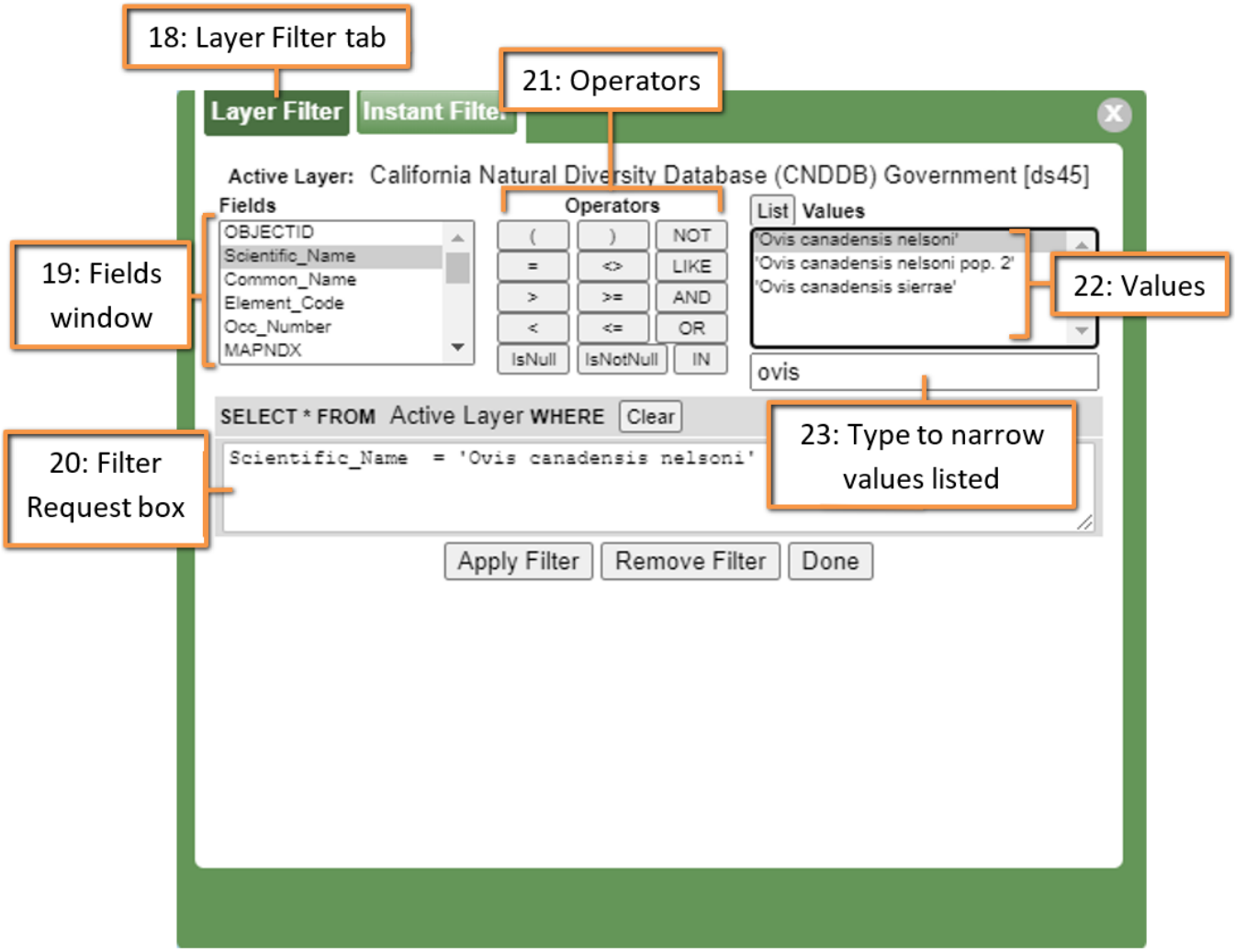
Instant Filter

With the CNDDB layer set as the Active Layer, expand the Advanced Tools menu [15] and then select Layer Filter. By default, the Instant Filter tab [16] will be selected, which allows you to easily filter the CNDDB occurrences to view a particular suite of species. The "DEF" next to the predefined filter expands and displays the definition query used to filter the data layer. Understanding the syntax of these definition queries may be helpful in creating a more custom filter under the Layer Filter tab of the Layer Filter window. Note that a filter icon [17] shows up next to the filtered layer in the Table of Contents. Hovering over the filter icon displays the filter definition query; clicking the filter icon opens the Layer Filter tool to allow you to change or remove the filter.



Layer Filter

With the CNDDB layer set as the Active Layer, navigate to the Layer Filter window (Advanced Tools -> Layer Filter) and click the Layer Filter tab [18]. Here you can create a custom filter based on the attribute fields of the CNDDB data layer. The “Fields” window [19] shows all of the fields in the Active Layer. These are the fields that you can choose from to build a query. Double-click on a field name in the list to add that field to the Filter Request box at the bottom [20] where you will build the query command. A single click on one of the “Operators” [21] will add it to the Filter Request box. It may be useful to review the Operator definitions and descriptions in Appendix 1. Clicking the “List” button will list the values [22] for a field. Double-click on a field value to add it to the Filter Request box. You can also manually enter a value to narrow your list values [23] and pressing the Enter key on your keyboard. The “Filter Request” box [20] shows the query that will execute when you click on the "Apply Filter" button. This filter is defined by clicking on items in the Fields, Operators, and Values areas above.



A filter can be constructed to show a specific subset of the CNDDB data layer, or to exclude a portion of the data for display purposes (note: CNDDB recommends that all CNDDB-tracked species be considered during environmental review and not excluded from analysis). The Layer

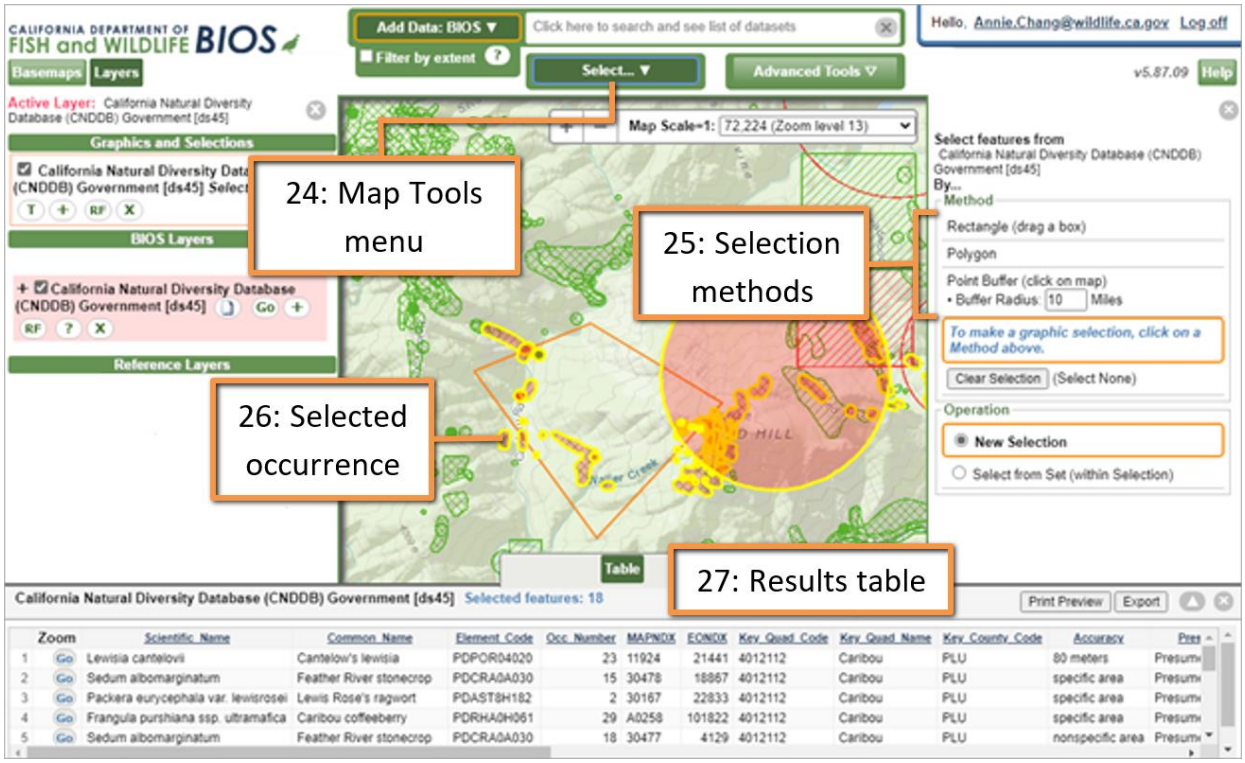
Filter only limits what occurrences are displayed in the BIOS 5 viewer. The next section covers Select tools, which provide additional reporting and exporting tools.

Selecting Element Occurrences

CNDDB Element Occurrence features can be selected either spatially in the map viewer or through a specific query selection. The spatial selection is useful for selecting all the occurrences in a particular area, whereas the query selection allows a selection through attributes (for examples, you may use the query selection to select federally endangered birds). To select occurrences from the CNDDB layer, please make sure the CNDDB layer is set as the Active Layer.

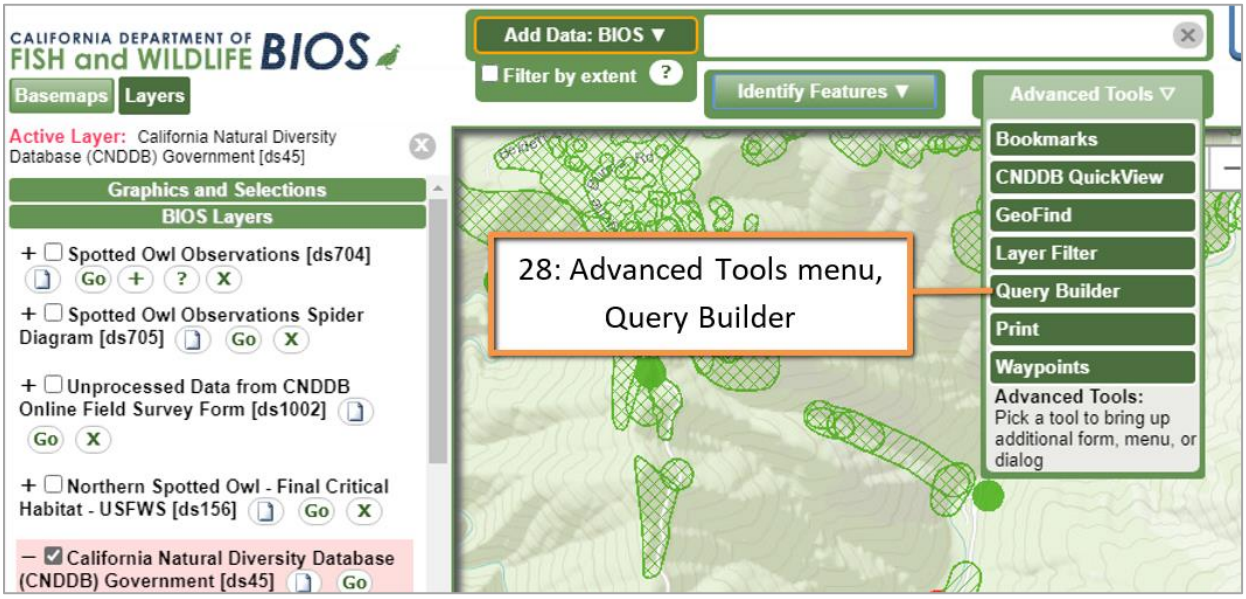
Selecting EOs – spatial selection

If you want information on a group of occurrences in the same general area, click the Map Tools menu [24] and choose "Select…" Three spatial selection methods are available [25]: click-and-drag rectangular box selection, click to draw a polygon of selection, and point buffer selection. All three selection methods will select any Element Occurrence that the drawn shape touches; they do not have to completely enclose the occurrence. Once the selection is made, the selected occurrence will be highlighted [26] in the BIOS map viewer and a table at the bottom of the map viewer will display the details of the selected records [27].

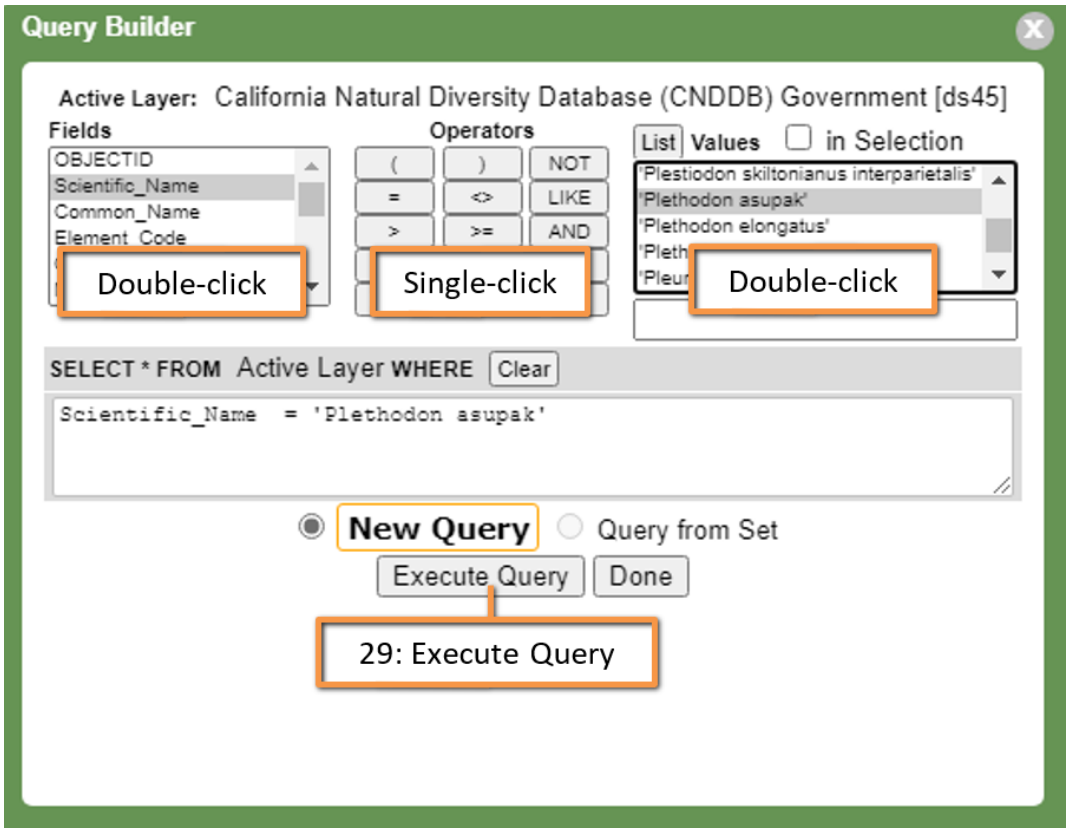


Selecting EOs – query selection

You can also select features based upon their attributes by using the Query Builder. Expand the Advanced Tools menu [28] and then select Query Builder. When you click on this tool, the Query Builder window opens.

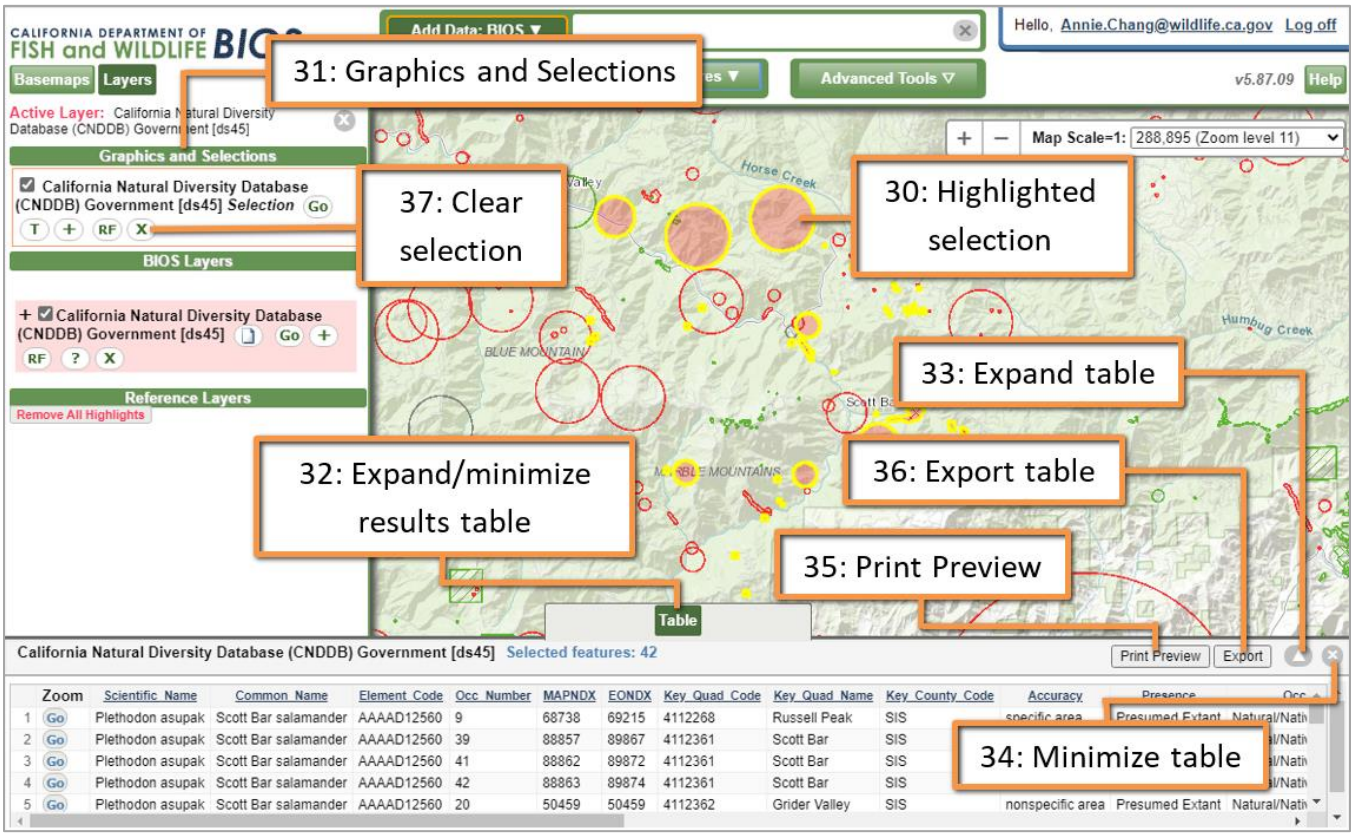


The Query Builder looks just like the Layer Filter; double-click an attribute in the "Fields" column, choose (single click) an Operator (descriptions in Appendix 1), and then scroll to and double-click (or type in) a Value. Note: typed values must exactly match the listed values. In the example here, the query will search for features that have a Scientific Name of *Plethodon asupak*. To run the query, click the "Execute Query" button [29].



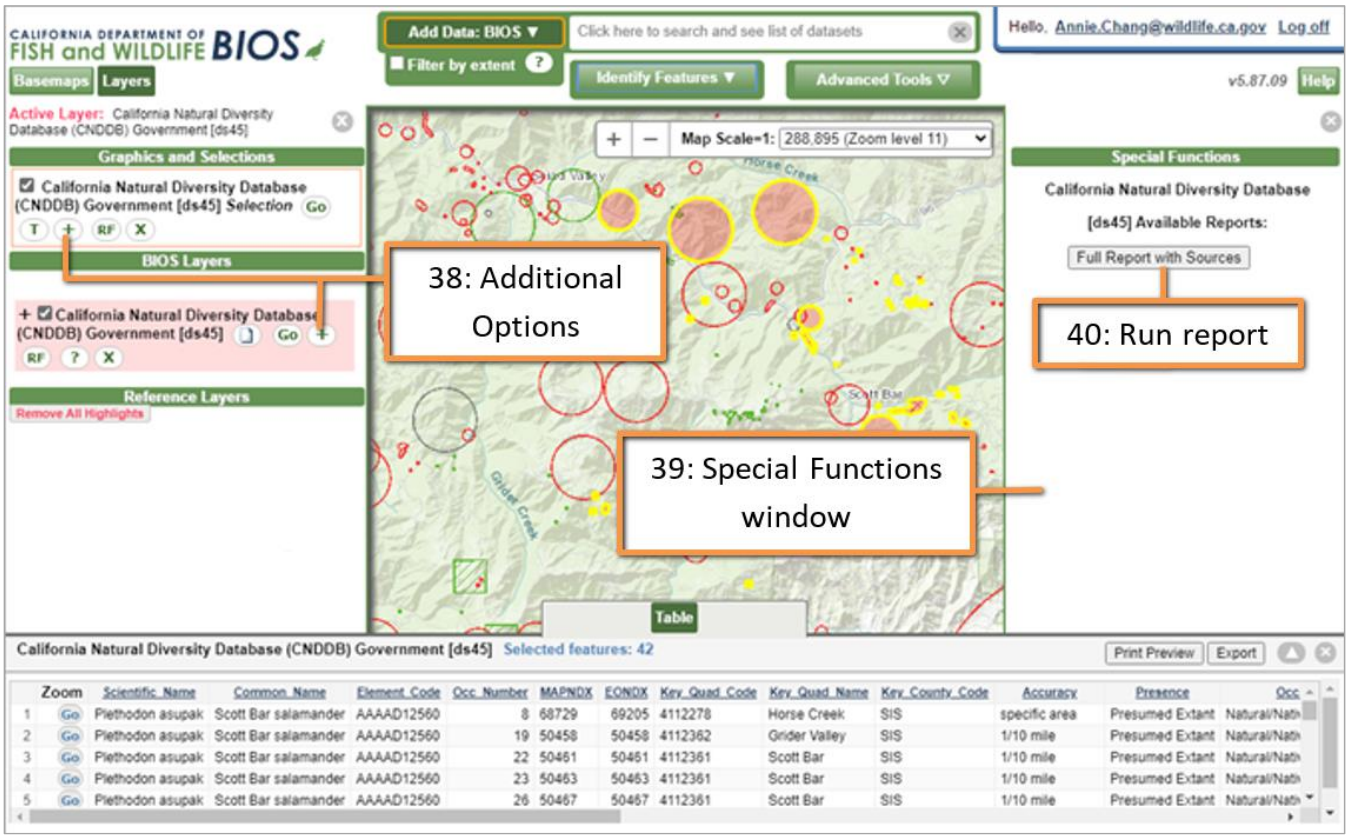
Using Selected Features

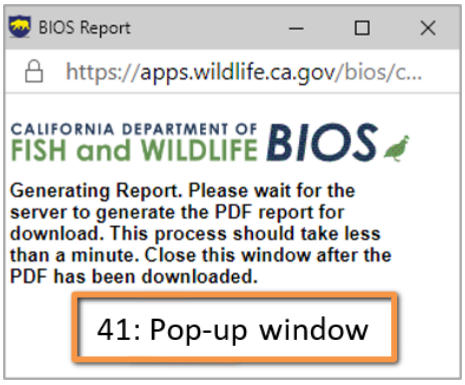
Once you've made a selection, either spatially or with the Query Builder, all of the selected features will be highlighted [30]. To zoom to the selected features, click and expand the Graphics and Selections portion of the Table of Contents [31] and click the "Go" button next to the layer selection. A limited amount of text data on each occurrence record is displayed at the bottom of the screen in the table. The "Table" button [32] located at the top center of the table will expand or minimize the table. The table can be further expanded using the triangle button at the top right side of the table [33]. The table can also be minimized by clicking "X" button at the top right of the table [34]. For easier viewing of the tabular records, the "Print Preview" button [35] will open a new, larger window with all of the tabular information that is shown at the bottom of the main screen. You may choose to export the table into Excel by using the "Export" button [36]. If you want to clear the current selection, click the "X" button [37] next the layer selection under Graphics and Selections in the Table of Contents (Note: clicking the "X" icon next to the CNDDB layer name under BIOS Layers will remove the CNDDB layer).



Reports

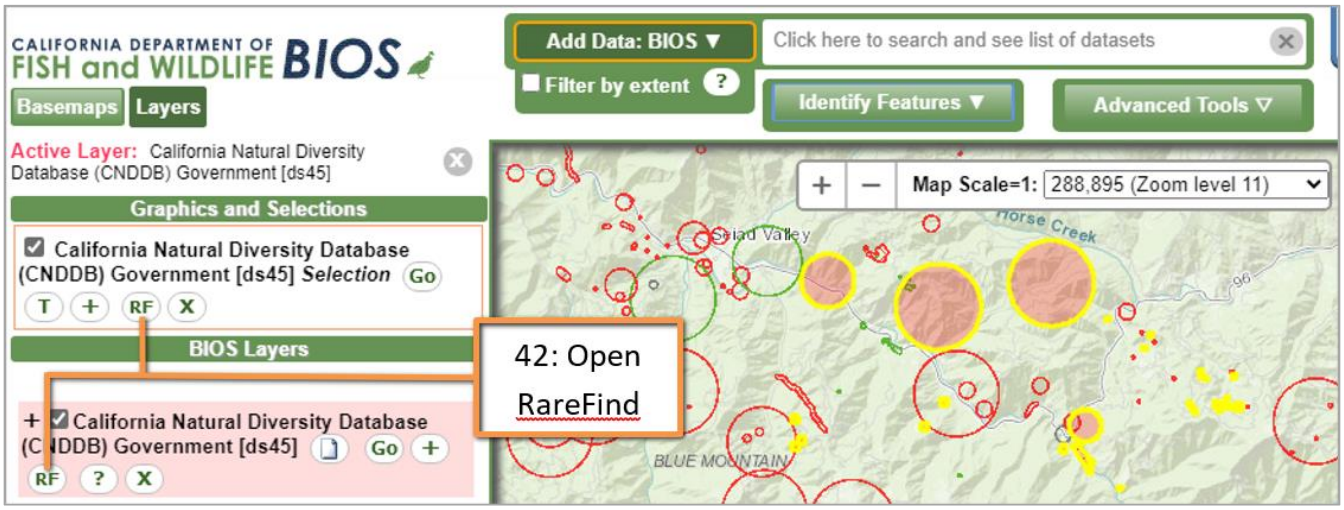
After Element Occurrence records are selected from the CNDDB layer, an Element Occurrence Report can be generated. To generate a report, go to the "+" button (Additional Options) next to the layer name in either the Graphics and Selections or BIOS Layers sections of the Table of Contents [38]. The report will generate for the selected occurrences regardless of which Additional Options button you press. A Special Functions window pane [39] in the right portion of the map viewer will open up. Click "Occurrence Report" [40]. A small window will pop-up [41] and notify you that the report is being generated and to wait a little bit. Open your report and then close the pop-up window. Additional report formats and tabular data exports are available using [RareFind 5](#).

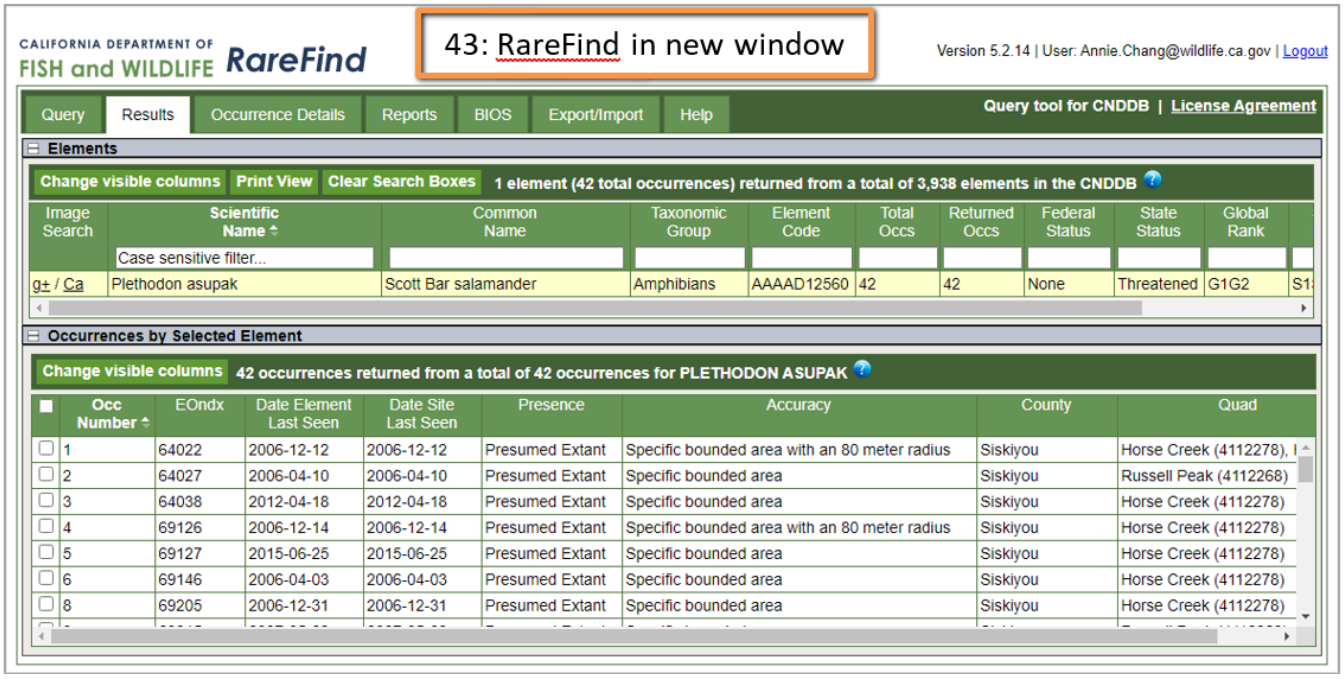




Export Selected Records From BIOS to RareFind

For further analysis of occurrence details or reporting functions, a selected set of Element Occurrences from the CNDDB layer in BIOS can be exported to RareFind. Click the “RF” button [42] next to the CNDDB layer either from the Graphics and Selections portion of the Table of Contents or the BIOS Layers section of the Table of Contents. This will open RareFind in a new browser window [43] with the selected records loaded. If RareFind is already open in a different browser window, RareFind will refresh with your BIOS selection. Please allow pop-ups if alerted.

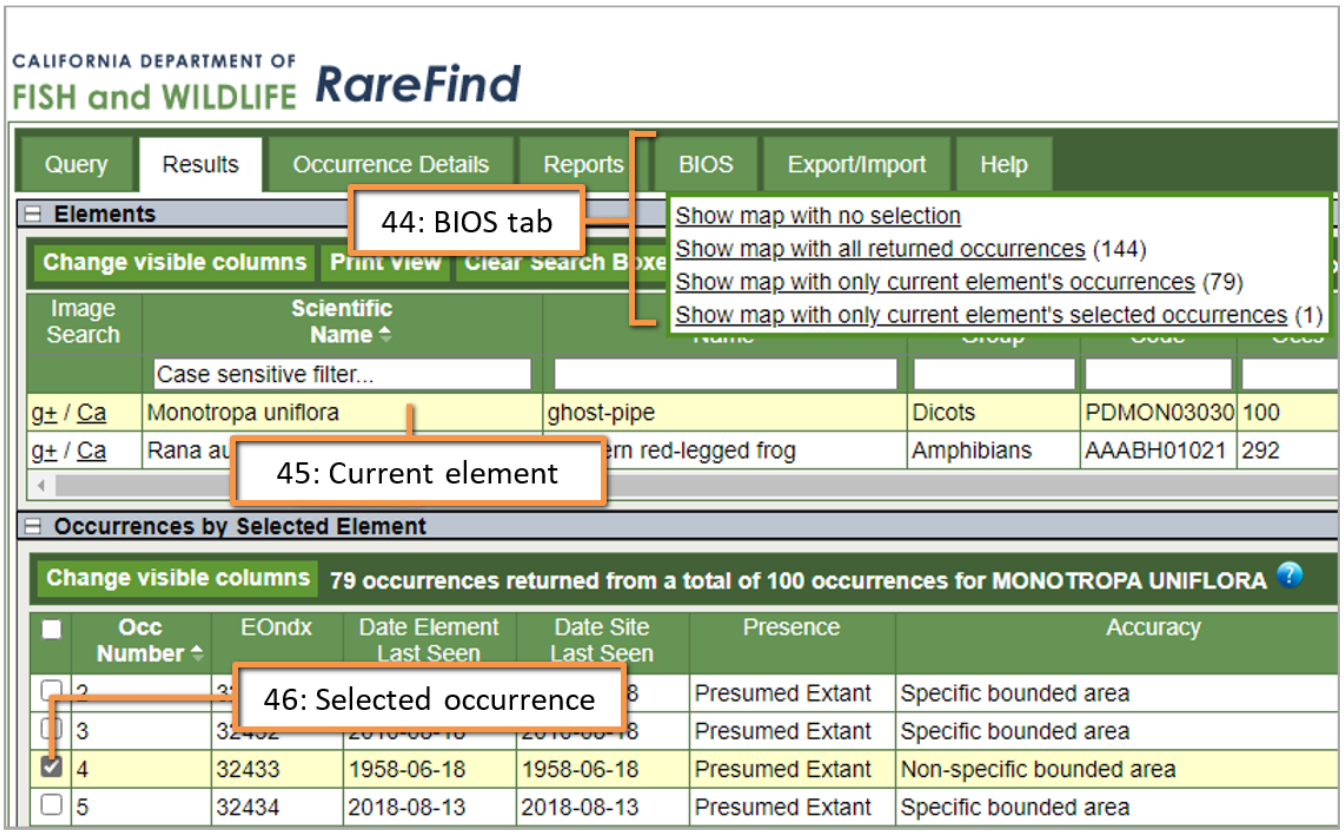




Export Selected Records From RareFind to BIOS

The previous demonstration showed how to pass selected CNDDB occurrences in the BIOS 5 viewer to RareFind 5 (RareFind has more reporting and tabular export functions, as well as more data fields available). Conversely, a selection can be made in RareFind 5 and exported to BIOS 5 for better map and spatial data viewing. Furthermore, BIOS 5 contains a printing function that creates a PDF map of the data and view displayed in BIOS 5, which could be saved for printing, emailing, or adding to documents.

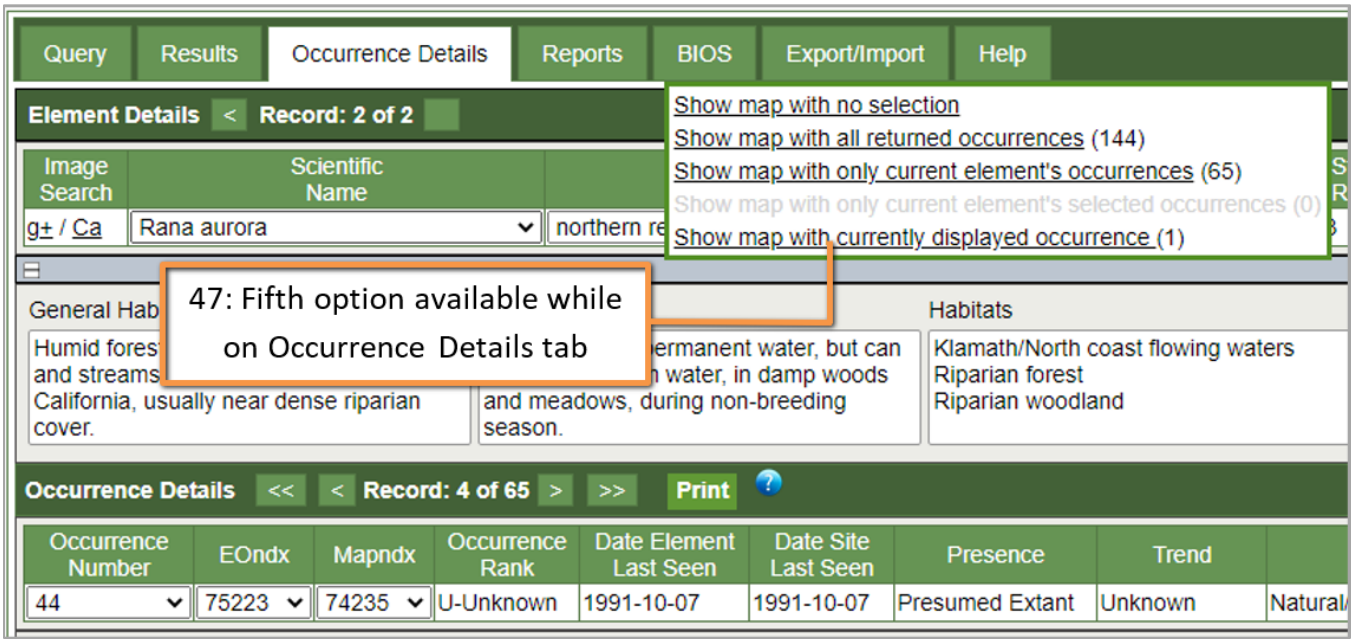
Once a query is made in RareFind 5, simply click the BIOS tab in RareFind [44]. Unlike other tabs, clicking on the BIOS tab will not take you to another screen. Instead, it will open a small window with up to five options. The BIOS tab is best used while viewing the Results tab; what you have selected in the "Elements" [45] and "Occurrences by Selected Elements" [46] tables will affect the options you may choose from.



- **Show map with no selection**: This option will open the BIOS 5 map viewer in a new window (if it is not open already) and then load and display the CNDDB layer.
- **Show map with ALL returned occurrences (#)**: Opens BIOS 5, loads the CNDDB layer, and then zooms to a layer created from all the occurrences your RareFind 5 query. The number of occurrences selected is shown in the parentheses.
- **Show map with current element's occurrences (#)**: Opens BIOS 5, loads the CNDDB layer, and then zooms to a layer created from the occurrences for the current element [45] highlighted in the RareFind Results tab (all occurrences displayed in the

Occurrences table at the bottom of the Results tab). The number of occurrences selected is shown in the parentheses.

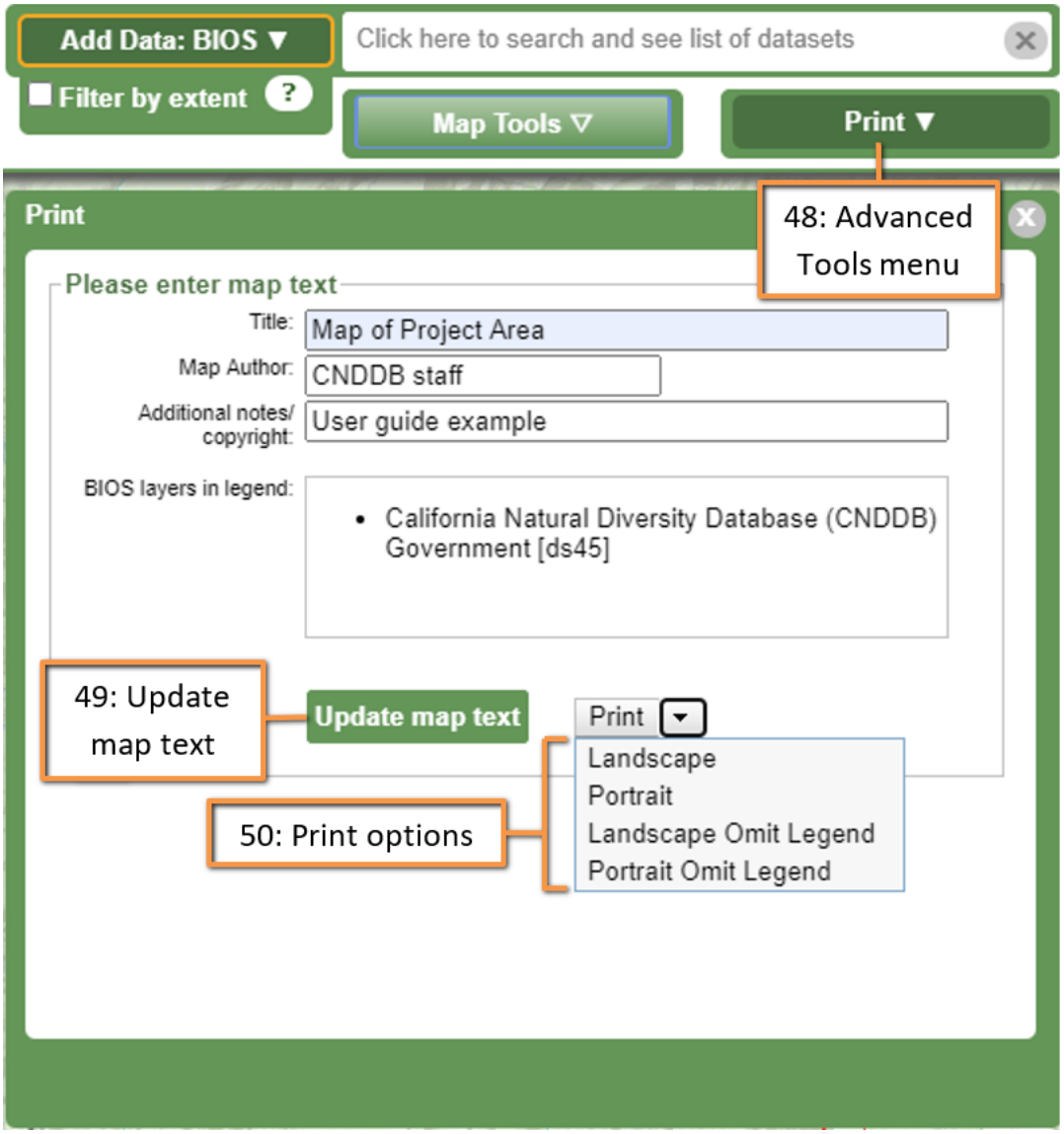
- **Show map with current element's selected occurrences (#)**: Opens BIOS 5, loads the CNDDB layer, and then zooms to a layer created from the selected occurrences [46] of the currently selected element (occurrences checked in the Occurrences table). The number of occurrences selected is shown in parentheses.
- **Show map with currently displayed occurrence (#)**: This option is only seen when clicking on the BIOS tab while on the Occurrence Details Screen [47]. This option opens the BIOS 5 data viewer, loads the CNDDB layer, and then zooms to a layer created from the occurrence that is currently displayed on the occurrence details screen.



Please allow pop-ups for the BIOS browser window to open. For more information on how to work with the CNDDB data in RareFind 5, refer to our Rarefind 5 User Guide.

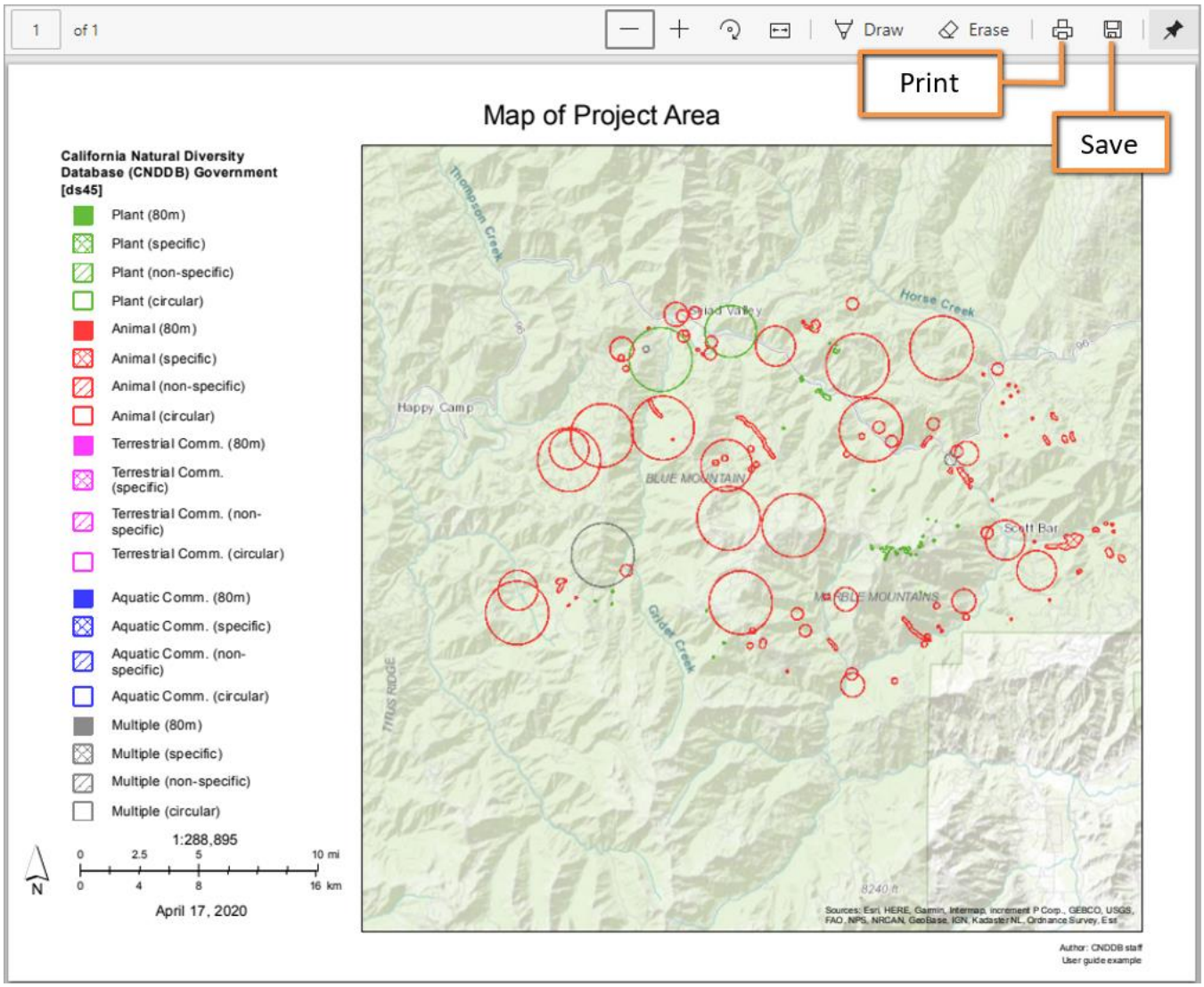
Create PDF of Map & Data

The Print tool in BIOS 5 allows you to print your current map view into a PDF. First, navigate to your area of interest, select an appropriate basemap, have the layers turned on that you are interested in showing on your map, and add any labels to your map (Add Label is an option in the Map Tools menu; see the BIOS 5 User Guide located under the Help button at the top right corner of the BIOS 5 map viewer). Once you have the view and layers set up the way you like, go to the Advanced Tools menu and select Print [48].



The Print/PDF window will pop-up where you can enter the map title, author, and any additional notes in a comment box. Once you have these fields filled-out to your liking, click "Update map text" [49]. If this button is not pressed, the default text settings would be used. The Print button next to it has a triangle drop down menu. Here, you can choose the map orientation and whether to include a legend with your map [50]. After selecting your print option, the Print button will change to "Printing" while it processes and then "Printout" when it completes. If you click on the word "Printout," a new browser window will open (please

allow pop-ups), and you will see your created map. This map can then be saved and emailed, printed, or added to a document.



Appendix 1: Operator Descriptions for Query Builder & Layer Filter

Operator	*Description*	*Example Query*
=	Equals	Name = 'mount whitney'
<>	Not equal to	Name <> 'mount whitney'
>	Greater than	Elevation > 14000
>=	Greater than or equal to	Elevation >= 14000
<	Less than	Elevation < 400
<=	Less than or equal to	Elevation <= 400
%	Wildcard. Allows for any character(s) at this point in a string of text	Name Like '%whit%'
AND	Joins expressions. Returns records where both are true.	Elevation > 14000 and Name = 'mount whitney'
OR	Joins expressions. Returns records where either is true.	Elevation < 100 or Name = 'mount whitney'
LIKE	Used to find a portion of text, with a wildcard '%'	Name like '%whit%'
NOT	Used to find records without a portion of text	Name not like 'whit%'
IsNull	Returns records with a null (blank) value	Name IsNull
IsNotNull	Returns all records except those with a null (blank) value	Name IsNotNull
IN	Returns records that match a specified list of values in the specified field.	Name IN ('mount whitney', 'mount tam', 'mount shasta')